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IT is our aim, our ambition, our aspiration even, to build our Journal worthily and well, not for the hour only, but for future years; for the few men in the forefront of an enduring and a laborious Art; for the disciplined ranks of a distinguished Profession; for the young men—Architects to be—and for all who love a clustered column or a flying buttress, a traceried window or a Greek frieze; for the man, too, who honestly plumbs a jamb.

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An Architectural Causerie.

A Misdirected Attack. SOME of the borough councils of London are notorious for the disgraceful way in which they treat their officials, any Tom, Dick or Harry— butcher, pastry-cook or publican—deeming it his privilege to get up at a council meeting and criticise the surveyor or the engineer in such an insulting manner as to make it almost inevitable for them to resign. Criticism of a somewhat similar character was meted out to the City Architect (Mr. Joseph Hirst) at the last meeting of the Hull City Council, when the plans of the new City Hall were under consideration. One gentleman was good enough to state that if they put a bacon-box down with a pepper-caster on top of it, that would afford a fair representation of the outline of the building which is to occupy the centre of the Town Hall Square, “where the dock offices will be in contrast and where the lavatory will compare favourably with it.” Such witty remarks, as might be supposed, provoked much laughter, but we rather lose faith in this self-styled architectural critic when he says that, seeing its flat front, they would not be pleased, and that he understood Mr. Frank Matcham had already been called in “and had made some valuable suggestions”; which seems to imply that our critic looks on Mr. Matcham (who designed the London Hippodrome) as an architect of artistic merit. Other councillors at the meeting spoke against Mr. Hirst’s design, the plea being that they ought to have an open competition for a building which is estimated to cost £92,000; and “merchants, tradesmen, the legal and other professions, and the inhabitants generally,” have followed suit in decrying the design; while the local Press fills its columns with protests from “lovers of the beautiful,” ratepayers and others similarly qualified to speak. Then a frenzied leader-writer says: “How will Hull hold up her head when her citizens stand with visiting strangers in the midst of what ought to be a great, spacious and lordly square, surrounded by noble and dignified buildings? When the citizen points to his city’s public hall, will his cheek not mantle red with shame as he sees the stranger’s eye scan the shops beneath? . . . Is it to be endured? . . . Surely the kingdom should be searched for what is worthiest; surely the best and wisest counsel should be sought; surely the talent and genius of the land should be invited by competition to contribute their idea of what a public hall should be which would make Hull a proud and more beautiful city.” Now this sets forth what the general opinion is in Hull. We have not yet had the opportunity of seeing the design ourselves, but, judging from a very rough newspaper sketch of it, and recalling the very satis-

factory work which Mr. Hirst has already done (several examples of which we have illustrated), we should express the opinion that all this wild outcry is unfair to the architect, firstly, because the design is not what incompetent persons have described it to be, and secondly, the conditions imposed on him are overlooked, conditions which place the blame on the Council and not on their architect. To expect a man to produce a beautiful design for a city hall which has its ground floor made up of shops is asking too much, and so long as these are insisted on the design must be correspondingly marred. As to the question of open competition, we think the Council has done wisely in not adopting such a course. Their architect is familiar with the local conditions—the building materials, local labour and local traditions—and he has proved himself a capable designer. The opinion of the man in the street on architecture is not worth having: he knows nothing about it: he has vague likes and dislikes: his taste, or want of it, is bad:

reference department, unknown and unsuggested. At the close of the exhibition it is to be expected that many of these books will be sought for from the reference department for more complete study. Many books have to be brought before the general reader before he is aware of their existence. Such ignorance is often the only obstacle to a spirit of interest and enthusiasm the absence of which is too often put down to indifference. Mention may be made of Viollet-le-Duc’s “Lectures on Architecture” (translated), Stuart and Revett’s “Antiquities of Athens,” Britton’s “Architectural Antiquities of Great Britain,” Nash’s “Mansions of England in the Olden Time,” and Rickman’s “Attempt to Discriminate, &c.” Modern work is represented by volumes of “Architecture,” THE ARCHITECTURAL REVIEW, &c., and books on modern architectural criticism such as E. S. Prior’s “History of Gothic Art in England” or Leader Scott’s “Cathedral Builders.” This is an exhibition of real value



NO. 52, BEDFORD ROW, LONDON, W.C.

and his views are directed by his taste: yet this is the person who has been so busy in this outcry; this is the citizen whose cheek is to mantle red! Surely the heavens will fall. But in the meantime we would wish the lay critic to be quiet, for his voice is not pleasant nor his ideas worth the time and attention given to them. If a competition were held the cost of the building would be increased, and in all probability the design would prove inferior to Mr. Hirst’s.

Architectural Books in Libraries. It is interesting to note an exhibition of architectural books now on view in the Fine Art Gallery adjoining the public library at Cheltenham, the volumes being a selection from those in the reference department. The books are not arranged in cases, where one can only examine such pages as the librarian’s caprice dictates to show, but are laid out on open tables, so that Ruskin’s examples of the architecture of Venice can be looked through from cover to cover, and one has the opportunity of seeing many books which would otherwise have remained in the limbo of the

the nature of which should be encouraged and developed in other centres.

A Forthcoming Horror. THE announcement that an exhibition of Austrian fine art and decorative furniture is to be held in London during the coming season will be read with more dismay than pleasure, because a very shrewd guess can be made of the kind of work which will be exhibited; good work of its sort, but of a very bad sort. The South Kensington authorities have already seen fit to set before the public those characteristic examples of “L’Art Nouveau” which were offered to them by Mr. George Donaldson, and now we may expect to see some additional specimens dear to the heart of “Secessionists.” There is a glimmer of hope in the statement that the exhibition is being promoted by the Austrian Ministry of Commerce, but the fact that it will embrace “everything that is new, original or characteristic in Austrian decorative art” augurs the worst, for it means that we may expect a good percentage of,— curious—examples.



FRIEZE, BARBICAN.

SOME RECENT STREET ARCHITECTURE IN LONDON.—I.

By F. HERBERT MANSFORD.

TO say that East London affords an unprofitable field to the student of current street architecture is not to imply that its buildings are all dead dull, though most of them are so to the eye. Its wide main roads on a sunny day are less depressing in effect than Victoria Street, Westminster, Lisson Grove or the Harrow Road. But the architectural interest of East London is largely centred in ecclesiastical and municipal buildings. Structures of the former class are not fittingly considered in an article dealing with street architecture, and with regard to the latter the borough councils have scarcely had time to emulate the spirit which has stirred the West Ham Corporation. True, there is a new library at Limehouse, a modest building of yellow stocks with stone dressings, but as the only noteworthy features are the stone gable finials which take the form of open volumes, the less said about them the better.

The Whitechapel Art Gallery was illustrated in the BUILDERS' JOURNAL for April 24th, 1901. Like all Mr. Harrison Townsend's buildings, it is original and worthy of examination, but it appears to have squeezed itself into alien surroundings like its brother in Bishopsgate.

In no sense can the façade of the Welsh Calvinistic Methodist Chapel at Mile End be regarded as an example of ecclesiastical art. The custom of designing Nonconformist chapels as structures of the thirteenth century is rapidly passing away. The reaction is sometimes too complete and one cannot help noting the great secularity of design in the case of the Whitfield Tabernacle and of this chapel at Mile End. The rich buff colour of the terra-cotta, and the three semicircular windows divided by mullions give the elevation a very distinct and pleasing character, but, if it were not for the clearly lettered inscription, one might mistake this place of worship for a drill-hall. In the Mile End Road too is a blue Staffordshire brick tavern with yellow terra-cotta dressings, called "Ye Olde Red Cow," whilst in the Commercial Road is a well-designed and striking building, though the reason for its deep red colour from plinth to ridge is not obvious.

The construction of the District Railway Company's Extension to Bow has caused considerable demolition. It is to be hoped that the new buildings will be not unworthy of what was described by Hatton in 1708 as "a very extraordinary spacious street between Whitechapel Bars and the road to Mile End."

In a district like St. Luke's, where there is little of architectural interest beyond the asylum and a few churches, it is very refreshing to come across such a building as that recently erected for the Bovril Company at a corner of Old Street and Bunhill Row. The block attracts attention by its bulk and retains it by virtue of dignity and strength. The general walling is

of salt-glazed brickwork with the frequent use of stone for dressings. The long lines of string and cornice are broken twice by the vertical masses of the staircases, of which the narrow windows rise with the flights in a plain field of walling. The windows throughout the building are expressive: deep (14in.) reveals enclose those of warehouse and factory, while 4½in. is considered sufficient for the leaded casements of the offices. The main entrance of stone is recessed within a deep cove, cemented but unpainted, and approached by steps of white marble. Perhaps granite would have been more in keeping and some may consider the proportions of the doorway too low, but neither of these points can mar the pleasure evoked by so admirable a building. Messrs. Lanchester,

Stewart & Rickards have set a high standard of warehouse design in a neighbourhood which is becoming every year more commercial.

In Barbican, on the north side, is a new building of brick and stone, and between the rows of mullioned windows of the first and second storeys is a frieze sculptured in low relief illustrating the process of gold refining carried on within, a redeeming feature in an otherwise characterless street.

Against the south wall of the Metropolitan Meat Market a glass and iron shelter is being erected. Sir Horace Jones's elevations may not be very successful artistically, but the long level façades, decorated by frequently recurring pilasters, possess a quality of repose which is becoming scarce, and if this shelter be continued around the whole building it will be architecturally ruined. The section put up looks experimental, and should be declared an artistic failure, even worse than it was bound to be by the nature of the case.

The dullness of Cowcross Street has been relieved by the new front of a distillery for which Mr. Colcutt is responsible. The long low façade is composed of an unpolished granite ground storey of semicircular arches, a first floor of widely-spaced pedimented windows with intermediate walling of alternate bands of red brick and stone, and an upper storey of square windows set in a deep frieze enriched with panels sculptured in relief, the whole being surmounted by a bold cornice and balustrade. The building being low and broad, Mr. Colcutt had a rare chance to show how striking a simple roof may become in a town thoroughfare, but here, although the roof is ridged parallel to the road and broken only by a few small dormers, he has preferred to allow the pitch to be dictated by the modest internal requirements and placed a balustrade in front which effectively hides it from most points of view. But as designed the frieze and cornice crown the wall quite satisfactorily and with dignity.

Passing into Holborn the new front of the Birkbeck Bank looms largely in the view. Mr.



DISTILLERY, COWCROSS STREET, E.C. T. E. COLCUTT, ARCHITECT.



CHAPEL, MILE END ROAD, E.

Knightley had no easy task to treat satisfactorily a "pile" of this extent. The storeys mount up until the elevation becomes of unpleasant proportions, and it is scarcely too much to say that the building is only saved by the substructure of fclspathic piers and semicircular arches comprising the ground and mezzanine floors. Above the structure is faced with dull-glazed faience of a varying but always pale ochre tint, the deeper blue and brown of the older elevations not being repeated. The wall surfaces are cut up by a good deal of ornament in the way of modelled panels and portraits in relief. As most of these are about 60ft. above the pavement it is less regrettable that they chiefly represent generals more concerned with South Africa than such a peaceful institution as the Birkbeck Bank. Is there not a chance that if Macaulay's New Zealander ever wanders among its ruins he may mistake it for our new War Office!

Further west, Gwydyr Chambers presents a lofty front of red brick with stone mullioned windows surmounted by a bold cornice and two gables. The cornice is finely conceived, but the blocking-course above should have been deeper to allow the surmounting balustrade to be completely visible from the opposite pavement. The cornice is broken into short lengths by projecting bays carrying a small cornice of their own, of much smaller members although level with the former. It would seem that if the corona of the main cornice had been continuous greater breadth of treatment would have resulted.

The building, No. 52, Bedford Row, recently erected at the back of the First Avenue Hotel, and adjoining Gray's Inn, harmonises perfectly with its surroundings. Although based on Georgian models, the ironwork and other details disclose distinct freshness of design. The architects have solved the difficulty of treating satisfactorily five floors of windows in a plain wall by grouping the two lower and cutting them off from the upper three by a continuous balcony supported on coupled trusses. This treatment is the more appropriate here inasmuch as the lower floors are for professional purposes while the upper are residential.

Bloomsbury has not been itself since the bolts and bars succumbed to the attacks of the London County Council. Some of the longest gardens have been curtailed for the erection of flats, Russell Square is decked out with terra-cotta trimmings, and Southampton Row is a sad spectacle of lost opportunities, seeing that it will soon form a prolongation of the new street from Holborn to the Strand, and is to be widened accordingly between Holborn and Bloomsbury Place. The low blocks of flats on the east side revel in sham gables and other abominations, while the loftier buildings display attenuated columns eccentrically rusticated and features never studied in perspective, such as transomed windows of which the lower lights are nearly hidden by the balustrades in front and columns of which the bases are invisible.

The Hotel Russell and University College Hospital are the largest new buildings in the locality. With regard to the latter the underlying idea is that of a central administrative block communicating with four radiating wings by bridges. These wings are similarly connected to sanitary towers at the extreme angles of the site. An almost entire absence of corridor is thus achieved, but the isolation of the various blocks by air-ways has been already somewhat modified. Sanitary towers are distinctive features of hospital buildings and afford opportunities for picturesque design. In this instance Messrs. Alfred Waterhouse & Son have accepted the difficulty of a five-sided tower, strengthened the angles of the upper stage by boldly-corbelled turrets, and by carrying the main roofs of the ward pavilions over on arches have made it possible to terminate the towers as four-sided figures. On the transept of the west wing is a well-modelled panel of the royal arms recalling the fact that the whole structure is Sir Blundell Maple's memorial of the last Victorian Jubilee.

A lofty corner tavern of buff terra-cotta opposite the Whitfield Tabernacle in Tottenham Court Road is the work of Mr. Fitzroy Doll. The style of it, Gothic, is not what one might expect from its dedication to Apollo. The Muses look down from the nine niches in which they appear to

be sheltering from the rain. Certainly the umbrella-like canopies between the first floor windows are too low, and must have reminded the architect of one of the disadvantages of terra-cotta, inasmuch as stone canopies could have been modified without delay. Apollo, who is discreetly placed a storey higher, is less sheltered although less draped; he is perhaps considered to be above the clouds. The gables of Parnassus exhibit traceries of alternating designs, and the turrets are finished with battlemented parapets.

(To be continued.)

ARCHITECTURAL ASSOCIATION.

WOMEN PRACTISING ARCHITECTURE.

By Miss ETHEL M. CHARLES.

A MEETING of the Architectural Association was held on Friday evening last at 9, Conduit Street, W., the chair being occupied by the president, Mr. W. Howard Seth-Smith. After the minutes of the last meeting had been read and confirmed, Messrs. P. W. G. Rudhall (Brighton), C. K. Roe (Kensington) and B. Drummond (Fleetwood) were elected members of the Association.

A vote of thanks was proposed to Professor Beresford Pite for allowing members to visit Christ Church, Brixton Road, on February 1st. The president then announced the following additional donations to the New Premises Fund:—

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3,715 11 6

Total - - - £3,731 1 6.

(* In the total published in our last issue there was an error of £1 ls. due to one donation having been repeated.)

Some donations to the library were next announced, after which Miss Ethel M. Charles read her paper on "A Plea for Women practising Architecture." She said:—

I appear before you to-night with a certain amount of diffidence, as the subject under discussion is not of my own choosing, and I fear I cannot do it justice. The title, to start with, is somewhat misleading. The dictionary says: Plea means a lame excuse or apology. Now I do not propose to offer you any lame excuses or apologies, all of which would be out of place. I shall merely bring to your notice some facts relative to women and architecture, with most of which you are doubtless already familiar. Then again, the title seems to suggest that I am conscious of a feeling against women architects, and since I read the paper before your Association it further implies that I believe such hostility is to be found amongst your ranks. Now I wish it to be clearly understood that I disclaim both of these assumptions. Doubtless your Committee had their thoughts directed to the choice of this subject by the knowledge of the existence of this feeling; but, personally, I have never met with it. No one has ever maintained before me that a woman should not practise as an architect, and if this view is held I venture to think it can only be held by those outside the profession, who are consequently not acquainted with the functions, powers and responsibilities of an architect.

Since you are members of the profession, it seems superfluous to address you on the subject as you must know better than anyone what are the qualifications necessary for the exercise of the same, and therefore know better than anyone that it is not a case of man or woman being best fitted to practise this art, but that it is entirely a case of personal capacity.

In a back number of the "British Architect" I came across the following remark:—"Whether women as a whole are fitted to take up the profession of architecture we hold strong and, it may be, conservative views—views which we do not think it would serve any useful purpose to discuss." I hope very much that some one



HOTEL RUSSELL: ARCADE GALLERY TO HALL, FIRST FLOOR. C. FITZROY DOLL, ARCHITECT.

present holds similar strong and conservative views, and that he will be kind enough to express them, as I may tell you the subject was selected by your Committee as being a peculiarly useful and suitable one.

It would be a bold man who would assert that "women as a whole" are fitted to take up the profession, considering that so few women have turned their thoughts in its direction; but it would be a still bolder man who would assert that men as a whole are fitted to take up the profession, vide the enormities that are daily committed by men in the name of architecture. I repeat, it is not a case of men versus women; it is a case of individual capability and aptitude.

However, there are some people, we are given to understand, who do maintain that woman, *per se*, is unsuited for practising our art. Where in the weak point lies we shall no doubt discover in the course of the evening; but as far as I can judge it lies outside the woman, and is not a defect inherent in her. I suppose the reason why women should not practise architecture is because, except in one or two isolated cases, she has not practised it; and that is just no reason at all.

The same objection is brought forward every time that women have attempted to enlarge

their sphere of action, and yet yearly new proofs are given that intellectually women can, at least in many cases, hold their own with men. The results of University examinations show it; members of the medical profession testify to it; the legal profession numbers women in its ranks, both in France and in America, though up till now in England women have only been allowed to study for but not to practise at the Bar. "Let them study by all means," the conservatives say, "but draw the line at practice." And what is the use of instruction, I ask you, if it is to be turned to no purpose? What is study without an object? knowledge without application? It is simply creating wants without granting the power of satisfying them. Living is not learning, but applying what one has learnt.

If, then, it is granted that woman is intellectually capable of wrestling with the problems of architecture, are we to suppose that she is physically incapable of carrying on the work entailed? It were unreasonable to say her strength is not equal to the task when we see what women actually do in this country. Take chainmakers, for instance. Hundreds of women are employed in the very heavy work of chain-making, a most arduous trade, and you must

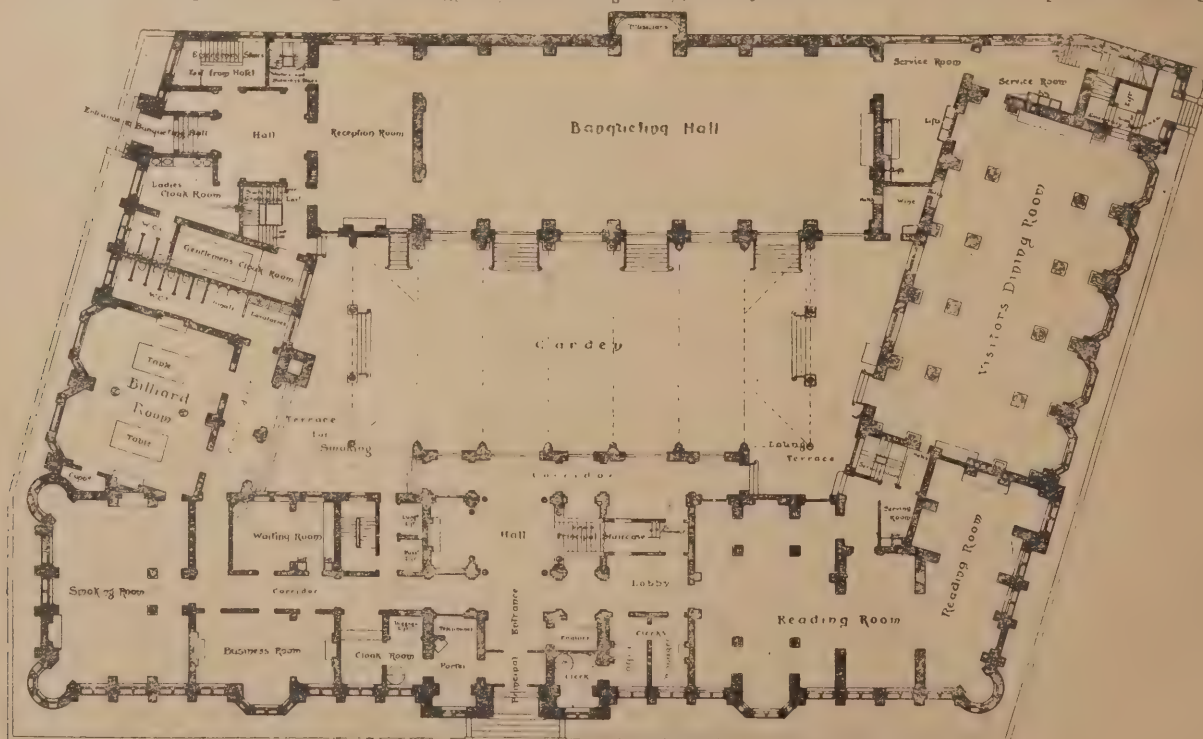
remember how two or three years ago certain philanthropists were anxious that legislation should interfere and put a stop to this, as they asserted the work was too great a strain for a woman. This intervention only resulted in the Home Secretary being besieged by indignant deputations of these same women, all protesting their competence and defiantly baring their muscular arms as evidence of the strength on which they prided themselves. Then, again, our agricultural labourers are not by a long way all men. In harvest time, when the work requires to be got through with all speed, women are called out to labour side by side with their husbands and brothers; they toil from earliest dawn to latest twilight, through all the burning heat of the early autumn day, and, so far from succumbing to this exposure, they weather it with the best of the men and live on to seventy and eighty years of age. Now the bodily fatigue an architect must be prepared to undergo cannot be compared to the physical strain our women endure when employed as field farers or as chainmakers.

I do not mean to say that the physical labours that women undergo as labourers or chainmakers fits them for the intellectual work of architecture. But I wish to point out that women are not all such delicate creatures as some people believe them to be.

I do not mean to make light of the arduousness of the profession. The mere study of architecture involves a great deal of physical as well as mental strain, and since practice means the continuance of study and, added to this, responsibility, the profession is certainly not one to be adopted by the physically feeble. But women are not all physically feeble any more than men are all physically strong. You have heard of architects—men—breaking down through overwork, but you do not for that reason say that all men are unfitted to practise the profession. I have never heard of a woman architect breaking down, but neither do I assert that all women are fitted to practise architecture.

Those who base their objections to women architects on the fact that they are an innovation, and therefore to be suppressed, will fling their prejudices and fears to the winds when what is now an innovation comes to be a recognised institution. Already in America one town has a lady for a consulting architect, and we are given to understand that her designs for schools, prisons and railway stations compare favourably with other similar works in the country.

But there are some opponents who are more specific in their objections, and it is with these we must now deal. Their objections really arise from an imperfect knowledge of what an



HOTEL RUSSELL: GROUND-FLOOR PLAN.

architect is. There is a general idea afloat that architects "make plans" and climb ladders, but beyond these two accomplishments nothing certain seems to be known. The former occupation is acknowledged to be quite a legitimate one for a woman, provided she have the necessary brains, but the latter cannot be countenanced for a moment, even though she may be sufficiently courageous to attempt it, and can be trusted not to lose her head on the scaffolding. As far as I can gather, it is not the climbing that is objected to, but the fact that she may be *seen* climbing the ladder. Therein lies the difficulty. No less an architect than Wren shows us a way round, if not over, it. The famous Duchess of Marlborough informs us that Wren "was content to be dragged up in a basket three or four times a week to the top of St. Paul's, and at great hazard, for £200 a year." No one could object to a woman being hoisted up in a basket any more than they could object to her making use of the more conventional elevator. Climbing a ladder is condemned as unwomanly, but so was riding a bicycle or being seen on the top of an omnibus not so very long ago, and yet all are now seemingly reconciled to these unwomanly practices. Besides, the latter question could only be raised by persons who are in ignorance of the portion of a lifetime that an architect spends upon a ladder, and this is so infinitesimal as to be unworthy of consideration.

But, besides the objector to innovation and the objector to ladder-climbing, there is the man who has dealt personally with architects as their client, and who knows very definitely what an architect is and what he expects from him. He must be a thoroughly artistic, scientific and practical man. He must be able to design at all possible speed—by return of post we were told last Friday—a convenient, durable and beautiful building of any one of the three groups into which buildings may be roughly classified—domestic, ecclesiastical and civil. He must have an intimate and familiar knowledge of every material and every trade employed in the realising of the said building, in order that none but the best of its kind and the best of technical skill may be employed. He must be a master of scientific construction, in order to prevent waste of time, material and money. He must keep all accounts relating to the work, bear in mind the interests of client and contractor, and manage everything without allowing any friction to come about between the different parties concerned. This list is not complete; I have mentioned but a few functions required by an employer of his architect. For the sake of argument we will suppose that they appear to offer just so many objections to a woman following architecture.

To succeed in architecture one must be, as I have said, artistic, scientific and practical in business matters; that is to say, success is largely a matter of natural gifts, education and experience. Now, who will assert that the necessary gifts are not and cannot be possessed by woman; that she does not receive the requisite general education, and that experience may not be acquired by her as well as by man.

Let us look first at the aesthetic side of the question. Architecture has been defined as good construction inspired by an artistic motive or by the instinct of the beautiful. Now this instinct of the beautiful, or as the French put it better, *ce sentiment du beau*, is as a rule more strongly developed in the woman. Nearly every woman is more or less impressionable and receptive, that is, she is an artist by temperament. Her taste will lead her instinctively and intuitively to a result which a man will reach by a series of criticisms and reasonings. He sees the truth; she feels it. The beautiful is attained by both; what matter if the paths they follow be different.

In most cases (outside the profession, be it understood) who is it that cares to be surrounded by beautiful objects and attempts as far as is possible to make the home a thing of beauty? It is certainly not the average man, who so long as he is comfortable cares little for the appearance of his surroundings. It follows, then, that it must be the woman, who will cheerfully sacrifice even comfort to her conception of beauty, if any choice have to be made between the two.

Some people go so far as to say that a woman

must necessarily know how to plan a house better than a man, because her household duties suggest to her the wants and requirements that must be met. We do not entirely agree with this view. The best housekeeper in the world may have most definite ideas as to what she requires, but she will not produce a plan—that is, the suitable disposition of spaces—till she has realised what rules and precepts must be obeyed in planning a house. And these rules, being all based upon common-sense and obvious reasoning, are as patent to men as they are to women.

We must not, however, lose sight of the fact that the influence of women in domestic architecture has been felt ever since the progress of social relations made her the equal instead of the slave of man. Woman's position in a country is the surest sign of the social progress in that country, and it was in the sixteenth century, when women began to be respected "as a whole" and not only in individual instances, that

have, it seems, little cause to regret old Chatsworth and Oldcotes. Besides her three country seats, this lady left "stately almshouses for twelve poor people" in Derby, and personally superintended the construction of "a splendid mural monument" to her own memory in All Saints' Church, Derby. Her biographer, alluding to her passion for building, describes her as "a woman of a masculine understanding and conduct; proud, furious, selfish and unfeeling." Apparently we are to gather that these unattractive qualities, pride, violence and egoism, go hand in hand with a masculine understanding. If, as Hardwick shows, she lacked artistic feeling, she was, on the other hand, a thoroughly practical woman. Of the four husbands she outlived three were wealthy men who were able to supply her with the means of indulging in her favourite pursuit.

In France, where women stand out more prominently than in England, and during the early Renaissance, when they were most con-



UNIVERSITY COLLEGE HOSPITAL, W.C. ALFRED WATERHOUSE AND SON, ARCHITECTS.

domestic architecture regained its prominence. It was when a woman ruled this country and by her personality influenced many that castles, cathedrals and colleges—buildings designed by men for men—ceased to be the most important architectural objects erected. Elizabeth's reign is remarkable for the number of radical changes which took place, and in no direction was the change so marked as in architecture.

At the time when, under James's rule, the Scotch were dwelling in fortresses about as comfortable as a Norman keep, the English under Elizabeth were vying with each other as to who should build the most roomy, most convenient and most beautiful houses. It is noteworthy that the great Queen spent not a penny herself in the interests of building, but she gave her noblemen much moral support, encouraging them to spend their thousands in erecting palaces worthy of receiving her as a guest. One of the most indefatigable builders of that time whose name has come down to us was a woman, Elizabeth of Hardwicke. Of the "three most elegant seats that were ever raised by one hand," so says her biographer, only Hardwicke Hall remains, and judging from its monotonous symmetry and extravagant window-space, we

spacious as politicians, warriors and poets, we find them occupied with building at an earlier date than at home. Marie de Pierre-Vive, Dame du Perron, one of the ladies of the household of Catherine de Medicis, was officially associated with Philibert de l'Orme during the erection of the Tuileries. In 1566 her name stands among the list of "MM. les Surintendants des Batiments du Roy," and it is interesting to note that where she and de l'Orme signed papers together, Dame du Perron's name comes first. Her royal mistress was another woman of "a masculine understanding," and insisted on her own plans being used for her palace. De l'Orme writes to her: "Lequel Palays je conduis de votre Grace suivant les dispositions, mesures et commandement qu'il vous a plait m'en faire."

But however artistic a woman may be, her natural gifts alone will not suffice any more than will those of a man without study and direction. Art has its restrictions and its limitations, which must be recognised and appreciated if truth and nature are to be our guides; and architecture is particularly restricted and limited both in theory and in practice. In theory it is bound by those rules of art inspired by taste based on tradition, and by those rules

of science which can be demonstrated by invariable and absolute formulæ. And in practice it is limited by structural conditions, which, if neglected, result in the collapse of the building; it is limited by the physical properties of material, by the climate, by the habits and customs of the moment.

Study of æsthetic rules produces fine designs and study of scientific laws produces fine construction. Now, construction demands a knowledge of the principles of mathematics besides a knowledge of the properties of building materials. Mathematics involve logic, or the science of reasoning correctly, and hitherto logic has been held to be the peculiar inheritance of man as opposed to woman. It may be freely granted that among uneducated women possibly a larger proportion are more illogical in their every-day conclusions than among an equal number of uneducated men: but it by no means follows from this that the brain of the average woman of education is less capable of mastering the science of logic than that of the average man of education. Now, we are only discussing cultivated women, and all reference to the uncultivated and illogical class is beside the question. That logic can be mastered is proved by the successful results achieved by women at the Universities, where they show peculiar aptitude for the science of mathematics, the numbers who devote themselves to this study being great, out of all proportion to those who select other schools or triposes. Again, at the École des Beaux-Arts, where the architectural course includes, besides an immense variety of other subjects, a very high standard of mathematical ability, a woman, an American, has lately had the honour of carrying off the Premier Prix over the heads of her brother students.

But pure mathematics are of little use without familiarity with the properties of building materials, and this familiarity, it is argued, can only be gained by a technical knowledge of the trades employed in building. In the Middle Ages the architect was only distinguished from the workman by conspicuous natural gifts and greater skill in technique; he who was most familiar with his materials produced the finest designs. The workshop was then the training ground for the embryo architect, and doubtless would have proved a rough school for a woman. But now, however much the fact may be deplored, most of the architect's work is produced in an office and not in a workshop, and is due more to his intellectual activity than to his manual skill in any trade. If, then, good design depends upon the proper use of material, and this use may only be learnt through handling it, how comes it that fine designs are produced by men who are in no way fitted to work with such material, and that on the other hand most of the builders who dispense with the services of an architect, and many of whom are skilled in one or more trades, produce crude results which, though they strive after, fail to realise architectural effect? The answer is simple. It is largely a matter of education and deeper preparation which enables the sharpened intelligence to grasp more readily the principles of technical skill. This general education is indispensable to architectural study, and since there is but slight difference nowadays between the course of education pursued by men and women I cannot see that the absence of workshop training should nowadays hamper a woman any more than it does a man. Do not mistake my meaning. Education cannot create the gift of design—for designers, like poets, are born and not made—but it fosters and encourages this gift and calls out the highest faculties when they do exist in the student. No amount of training will make the deaf and dumb to sing; but, for all that, training is invaluable, not to say essential, to a singer who

intends to do his voice justice. If I may be allowed a misquotation:—

"Books, gowns, degrees will leave a fool a fool.

But designs are best when the designer's been to school."

Granted, then, that woman is fully competent as far as the æsthetic and scientific sides of the profession are concerned, there remains the economic side to be considered. This covers all the business transactions that take place between the architect, client and contractor, and involves the exercising of a large amount of tact in order to make matters run smoothly. Without tact a business man will not go far, and this indispensable quality seems universally acknowledged to be dealt out more generously to woman than to man. In France every woman is born a business man and her taste is never questioned, whereas in England it is the exception to find a man who combines artistic talents with business qualities.

The stumbling-block in the business relations seems to be that the architect is responsible for the quality of the work done and so has to oversee and direct the workmen. This, for some reason, is supposed to be beyond the powers of a woman; I am told it is objected she cannot

servants and labourers, it shall be construed his fault, and he shall be liable to be censured by the Commissioners." Besides, swearing at one's subordinates is really not as fashionable as it used to be. In the Army and the Navy, where formerly the slightest order was accompanied by a volley of oaths, the change is strongly marked, and the officer who now so far forgets himself as to swear at his men lays himself open to a severe reprimand from his superior officers.

I think I have touched upon most of the points which might be brought forward as objections to women practising architecture, and I trust we shall all be agreed that the obstacles are more imaginary than real. But there is one other point I ought to refer to before closing, and that is the "new style" that some people are clamouring for. Since women began to study architecture it has been suggested that they may supply this pretended want, but as yet there has been little to warrant the conjecture that fresh inspiration will come from that quarter. Women make intelligent interpreters and passionate disciples, but, to judge from the testimony of bygone centuries, their power stops short at creation. It may be

wrong to assume that women are totally wanting in inventiveness, and it may all be a question of upbringing and training. Hitherto men have always led the way, for the race is to the swift and the battle to the strong, and men have been the swift and the strong since women's upbringing taught them only dependence and reliance and in no way fostered originality. But nowadays women are expected to think and act for themselves, and this self-dependence and self-reliance may prove to be the generating spark which will rouse to activity the originality and creative power which, for all we know to the contrary, may long have lain dormant within them.

But in any case this want of creative faculty would not hamper a woman architect. Architecture is a logical art, and no change has taken place in it without a very obvious reason, and when no reason can be adduced for original and capricious designs, such productions are grotesque and not architectural. The truest architects are not distinguished for brilliancy of invention so much as for careful attention bestowed on the smallest details of their work, and women "as a whole" possess the faculty of worrying out details so small that they often are apt to escape the attention of the more comprehensively-minded man.

If I do not stop now you may go away with the impression that I consider women more fitted to practise architecture than men, but nothing could be further from my thoughts, although Sir L. Alma-Tadema told us that the essential element of our art is beauty and that the essential element of beauty is woman.

The Discussion.

In proposing a vote of thanks to the lecturer Mr. Arnold Mitchell observed that art had its limits and so also had sex. In the course of practice the architect had to deal with his client and his builder. From the former he took his instructions and to the best of his ability he endeavoured to carry them out, and up to this point there was no reason that the man should do better than the woman; but there was the contractor to deal with, and it was here that the limitations of sex entered. A woman, for example, might have to go on a building and object to materials. It was a most difficult thing for a man to take orders from a woman—his whole nature seemed to revolt against it—and with the contractor insuperable difficulties would occur. The woman could do the indoor work, but with that her ability as a practising architect ceased. She might achieve success in some particulars, but it was impossible to expect that she would always be successful, and yet that was essential to her practising architecture



THE "APOLLO" TAVERN, TOTTENHAM COURT ROAD, W.
C. FITZROY DOLL, ARCHITECT.

use the necessary amount of strong language to keep the workmen up to the mark. But surely there are other ways of enforcing your will than through the medium of strong language. There is not one man in twenty who has realized that gentleness may be a force. A man will boast of his want of self-control; he flatters himself that abusive language shows himself to be a man of strong character, a master; he would count himself less manly were he less violent, and yet you must confess that some of the gentlest men you know happen to be those who always get their own way and compel people to carry out their wishes whether they will or no. St. Paul's Cathedral, one of the finest examples of Renaissance work we have in England, is a living example of what workmen can produce without the stimulus of abuse. Wren had the "ungodly custom of swearing" in such abhorrence that he posted up an order to the effect that upon sufficient proof the clerk of the works should dismiss any labourer guilty of this crime, and further that "if any master working by task shall not upon admonition reform this profanation among his apprentices,



THE GRAND STAIRCASE FROM THE HALL.



ENTRANCE TO BANQUETING HALL.

HOTEL RUSSELL, RUSSELL SQUARE, W.C.

as a whole. He thought Miss Charles had raised a bogey about the use of strong language by architects to enforce the performance of work; his experience was that architects did not do so.

Mr. Leonard Stokes next spoke. It was not often, he said, that they heard so excellent a paper or one delivered with such sense; lecturers often gabbled out their papers, and that evening they had been taught a lesson. Miss Charles had said that men were responsible for the ugly buildings around us, but she did not say whether, if women were in the same proportion as architects, the ugliness would be any less. He thought however that she had proved a very good case for women to be allowed to try. As regards enforcing the performance of work, persuasiveness (which women possessed) was often as effective as anything else and he did not think it at all necessary to use violent language. At the same time it was difficult to imagine how a woman was to deal with an awkward contractor. Still, she dealt with cantankerous cooks! But there were great difficulties when cockroaches were concerned! She didn't like to put her foot down and that was sometimes necessary with contractors. A woman might climb ladders, but we were not accustomed to it; and though on a large building she might leave much to a clerk of works, on smaller jobs it would be necessary for her to attend to these matters herself; and he did not know whether a basket could always be provided. Even if she managed the scaffold—even if she escaped it—there were the prospects of matrimony. In early life she might study zealously, and then something occurred which upset all other ideas: and after that he did not think she could continue to practise. A woman was expected to look after her husband. It might be too much to expect of her, but so long as this was so he did not know how she was to continue her practice as an architect. One or the other must inevitably go to the dogs.

Mr. R. H. Weymouth did not feel that the paper carried conviction. He agreed with Mr. Mitchell's explanation of the limitations imposed by sex, though he thought that the office work could be admirably done by women; and this perhaps suggested a solution of the diffi-

culty, namely, that such details as cupboards, fireplaces, &c., could very properly be left to women, while the larger and rougher work was done by men. Probably women would do much better than men in decorative work.

Mr. Butler Wilson, president of the Leeds and Yorkshire Architectural Society, thought the criticism had gone away from the high standard set up by Miss Charles. In his opinion it was impossible for one man to cover the whole of the ground in fully carrying out the duties of an architect. This fact had been proved in medicine and was being generally proved in architecture, where specialists were found to be necessary for particular kinds of work: some men built asylums, while others built houses of a character calculated to fill the asylums. He thought there was a field for women as specialists in domestic work. He was rather inclined to think that decoration was the highest form of architecture.

Mr. H. P. G. Maule said the matter was one of personal capacity: if the woman had the desire and ability to practise she could do so, whereas if she failed in this, she simply dropped out; but men should put the opportunity in her way. He thought the Association was to be congratulated on being the first architectural body in this country which had had a paper read before them by a woman. By opening up the study to women they were doubling the chances of securing good work.

Mr. F. T. W. Goldsmith expressed the opinion that no woman would dare to tackle a man on a job beneath the unsympathetic gaze of the clerk of works, though she might do such things very effectively in private. He strongly objected to the proposal to disconnect work done in the office and on the building, as this was contrary to precedent; though if women chose to practise as consulting architects he thought a very large field was open to them. Men did not object to lady architects *per se*, but to incompetent lady architects.

After Mr. F. W. Marks, Miss Maule and Mr. H. A. Satchell had spoken the president remarked that Miss Charles had been through the whole of the students' course, and had passed the Institute examination. As a teaching body the Association was interested in this question. A woman might make architecture her liveli-

hood, and after marriage a supplementary livelihood. We should not forget that it was only during the last fifty years that women had really been educated, and the results at examinations were astonishing. The question before them that evening had been discussed during Mr. Mountford's presidency and it was then decided to allow ladies to enter the classes of the Association.

Miss Charles briefly replied and the meeting then ended.

A FIREPROOF RAILWAY STATION.

THE station at the Dingle end of the Liverpool Overhead Railway, at which the fatal fire occurred on the evening of December 23rd, has now been reconstructed. Between the Hercules Dock and the Dingle Stations there is a tunnel, and it was before the train emerged from the tunnel into Dingle Station that the fire took place, making a furnace of the station and the end of the tunnel, through which blew a westerly gale from the dock end. In the interval the station and its approaches have been reconstructed and improved. As suggested at the Board of Trade enquiry and the inquest on the six victims of the fire, wood and flammable materials have been reduced to a minimum in the refitting of the station. The platform, which was formerly of wood, has been rebuilt with brick side-walls and flagged with specially prepared stone, while certain wooden barriers, waiting-rooms and seats have been superseded by iron ones. The signal-box at the entrance to the tunnel has been rebuilt of brick, and the stairway from the platform to the exits has been roofed in and the sides covered with glass in iron frames. The latter improvement has been introduced in order as far as possible to prevent draught, a very important precaution, not only for the comfort of the passengers, but with a view to dispelling somewhat the force of any gale of wind which might, as on the occasion of the recent fire, sweep up the tunnel from the adjoining docks and fan the flames of any possible outbreak. Besides structural alterations, other safeguards against fire which have been introduced by the Company comprise the

equipping of the whole station with extinguishing apparatus, including two powerful chemical engines placed on the underground platform, and about 200yds. of hose. They are also the first railway company in Great Britain to adopt the May-Oatway automatic fire-alarm, which has been so arranged that should any fire occur in the station or its approaches, either on the upper floor or the underground platform, a simultaneous warning will be automatically signalled to the station officials and the Liverpool Central Fire Brigade. The detecting wires are almost instantaneously affected by the sudden rise of temperature occasioned by the lighting of a small fire, and electric bell-signals are thereby transmitted.

Bricks and Mortar.

APHORISM FOR THE WEEK.

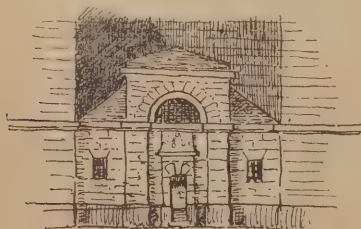
To build a house for oneself is an excellent education in architecture.—J. J. STEVENSON.

Our Plates.

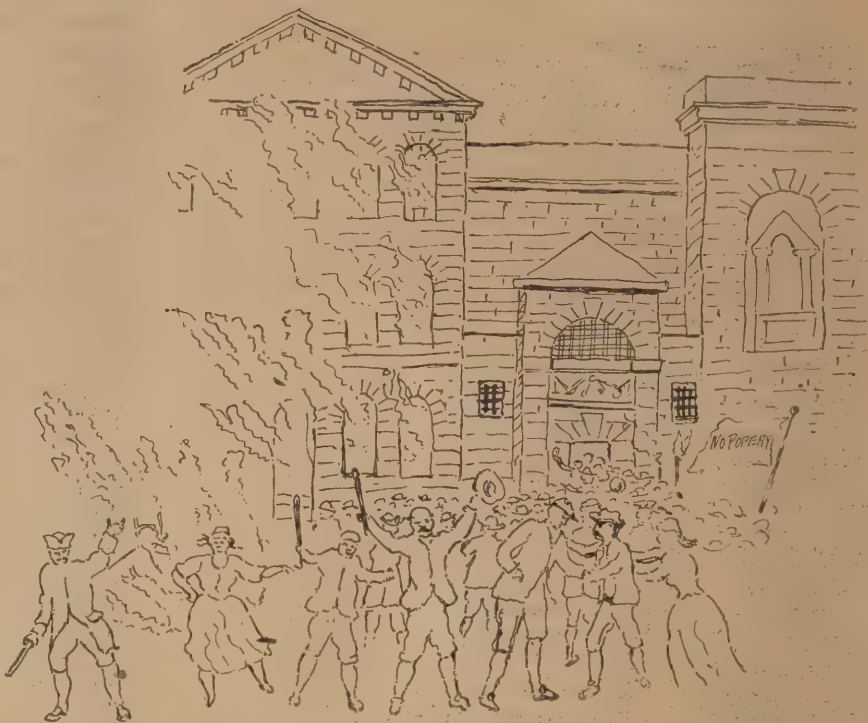
READERS will doubtless note with satisfaction a new feature in this issue—the photo-litho reproductions in the centre plates. Special arrangements have been made for the production of illustrations by this process, and drawings can be rendered by it which it would be impossible to reproduce by the half-tone or line processes. We hope to publish further photo-lithographs as occasion requires. Some particulars relating to Newgate Prison are given in the paragraph below, while reference is made to Siena Cathedral on p. 14 of this issue.

MR. THOMAS W. WALLIS, of Louth, who is termed by a correspondent "the greatest woodcarver who ever lived (not excepting Grinling Gibbons)," celebrated his eighty-first birthday on February 4th. Our correspondent continues: "In the fifties of last century his name was a household word amongst all lovers of art, his wondrous examples of wood-carving—more especially in the shape of groups in still life at the Great Exhibition of 1851—having startled all the world. In 1870 his sight failed him. At present he occupies much of his time in painting in oil. He has recently completed a life-size presentation portrait of Mr. Harry Hems. In 1899 he published his 'Autobiography,' a most interesting and instructive record of early reverses and ultimate success."

THE drawings of Newgate Prison which we publish this week, by Mr. W. Campbell Oman, are of special interest from the fact that this unique building, which exhibits, as Mr. Reginald Blomfield says, "the finest abstract expression of wall-surface to be found in Western architecture," is soon to be pulled down in order to make way for Mr. Mountford's new sessions house. It is interesting to note the pediment over the Governor's residence shown in the sketch on this page. This



pediment no longer exists, as an attic is now in its place; which goes to show that either this drawing is incorrect or that Dance altered his design during the much-needed repairs which he carried out after the Gordon riots. The same may be said of the set-back blank walls over the entrances, as their heights would have to be (according to this drawing) considerably increased to bring them up to their present height. Minor details such as the entrances and niches do not tally with those at present existing.



BURNING OF NEWGATE BY THE GORDON RIOTERS, 1780. (SKETCHED FROM A CONTEMPORARY PRINT.)

With regard to the small sketch in the preceding column, it should be observed that there are now no side roofs, while the flat arched openings with iron bars on the sides and lantern lights over the flat portions are interesting for a similar reason.

The Sieges-allee at Berlin.

THE completion of the Sieges-allee at Berlin, which furnished the German Emperor with a text for one of his most characteristic addresses, is a notable event, and one that should specially interest us while the Victoria-Memorial is in progress. It consists of a series of statues of the various rulers of Brandenburg and Prussia, from the Markgraf Albrecht the Bear to the Emperor Wilhelm I. Each is placed on a semi-circular terrace and flanked with half-length figures of the two leading statesmen of his reign, the whole arrangement being of white marble and forming a long succession of thirty-two groups arranged with geometrical exactitude on either side of a broad road in the Thiergarten. The work is by various sculptors—Walther Schott, Max Unger, Josef Uphues, Böse, Baumbach, Felderhoff, Carl and Reinhold Begas, Kraus, Herter, Von Götz-Schlitz, Brütt, Calandrelli, Lessing, Manthe, Magnussen, Schaper and others. The Emperor is of opinion that this body of Berlin artists is equal in merit to those of the Italian Renaissance, and that strangers are awe-struck by the result of their labours. The total effect is certainly novel, and some few of the groups rise a little above the level of respectable mediocrity, but mainly the effect is that of a somewhat uninspired attempt at realism. The best work is the decoration of the terraces, which have generally been kept rather simple, and in the aggregate make a not unimposing pattern along the sides of the road.

The Fractures at Truro Cathedral.

A MEETING of the Executive Committee was held recently to consider Sir Thomas Drew's report on the fractures in the bases of nave pillars in Truro Cathedral. The following official report has been communicated: "There was a full attendance. Mr. F. L. Pearson, the architect, and Mr. Ward (of Messrs. Willcocks & Co., the contractors) were present. Sir Thomas Drew's report was read. The details of this are at present confidential and will not be published until the General Committee have received it. But permission is given to quote the following: 'My general impression is that the magnitude of the occurrence of such fractures as these should

not be overrated, nor should they cause anxiety. Such unlooked-for occurrences are incidents in carrying out many building contracts, which are not heard of and are of no outside interest, and are set right, and are to the builders a vexation, not an anxiety.' No immediate steps need be taken, but the contractor has been desired to furnish an estimate for the removal of one of the bases of the piers in order that the knowledge of the causes of the fracture may be arrived at by actual inspection, and not rest only on theory."

Leeds Architects' Dinner.

THE LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY held its annual dinner last week. Mr. Butler Wilson, the president, was in the chair. Mr. John Hepper proposed the toast of "The Royal Institute of British Architects and Allied Societies." The president, who responded, briefly alluded to competitions. So long as architects had to start without clients, they must continue to go on the market and find a start in life in the competition world. But they had a right to expect that the assessors in these competitions should be men who had had a practical experience in the particular class of buildings that was under consideration, otherwise their awards could scarcely give general satisfaction. There was to-day a very strong movement in the direction of dealing with architectural problems in a quiet manner, and with a consideration for the requirements of their clients, without any regard to style or period. The advanced school had carried out this idea to an extreme degree. It appeared to him unreasonable that men should be asked to forget the architectural beauties of Yorkshire, for example. They must not be asked seriously to ignore the great store of knowledge which the world had placed at their disposal. There was no reason why they should not store themselves with this knowledge and, at the same time, be prepared to deal with every architectural question put before them strictly on its merits. Alderman Wurtzburg gave "The Leeds and Yorkshire Architectural Society," and Mr. G. F. Bowman responded. In giving the toast of "The Guests," Mr. W. H. Thorp deprecated the evils that the competition system brought with it. Architects were put to a great deal of expense, and with no return in the majority of cases. He suggested that the evil might to a certain extent be minimised if a system of limited competition were adopted by which, say, half a dozen members of the profession would be invited to send in plans, the unsuccessful competitors to receive an honorarium for their work.

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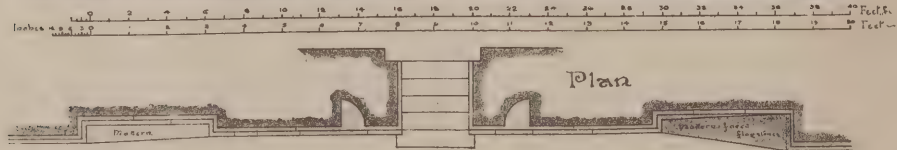
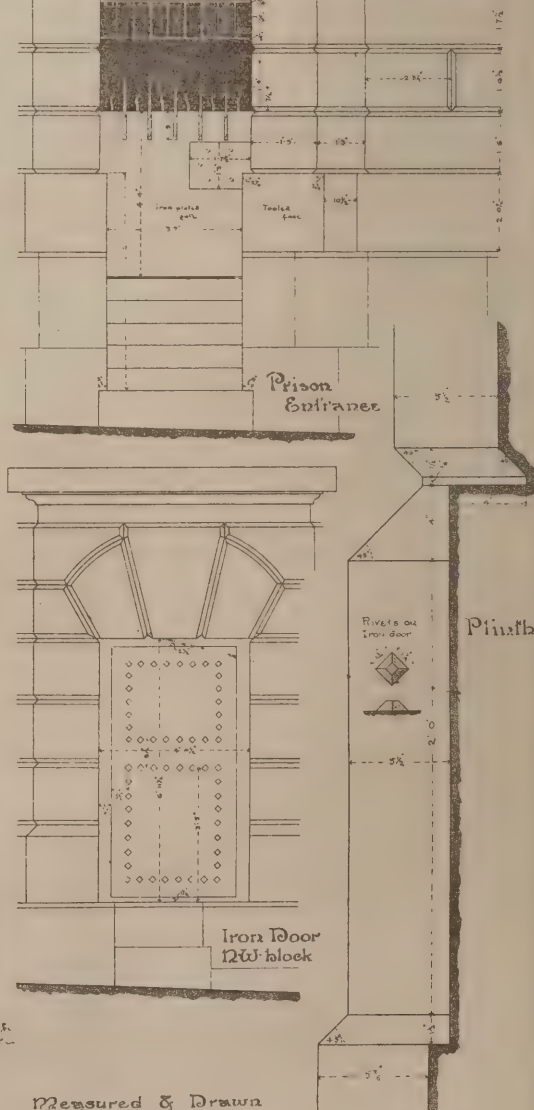
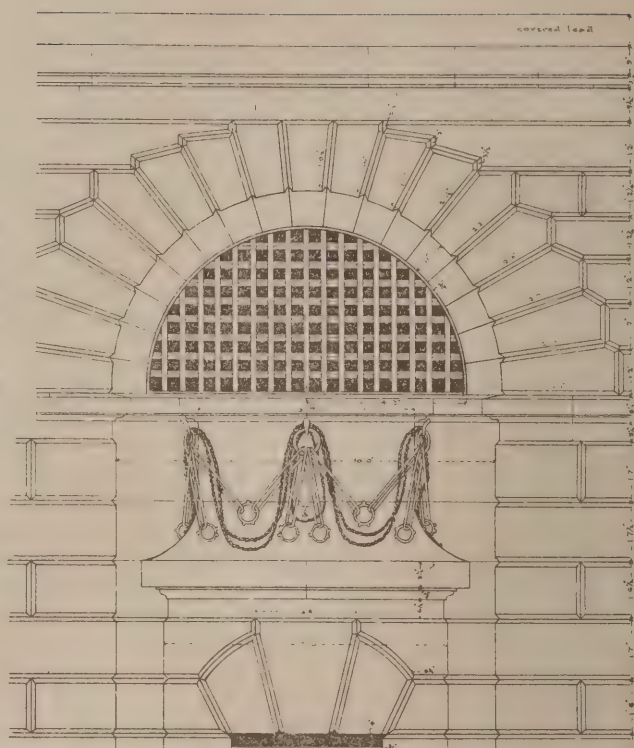
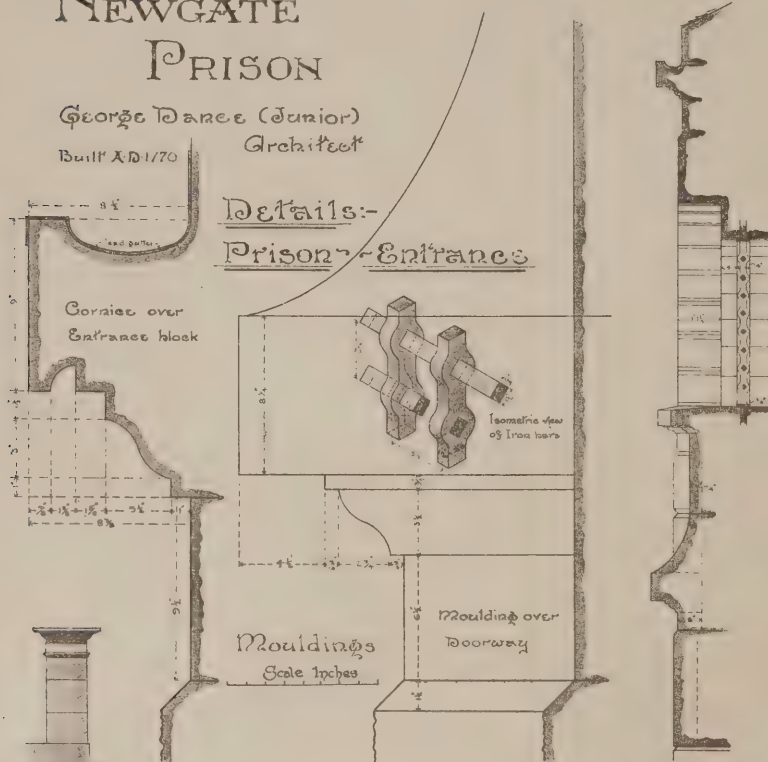
SIENA CATHEDRAL: THE FACADE.

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NEWGATE PRISON

George Dance (Junior)
Architect
Built A.D. 1770

Details:- Prison Entrance



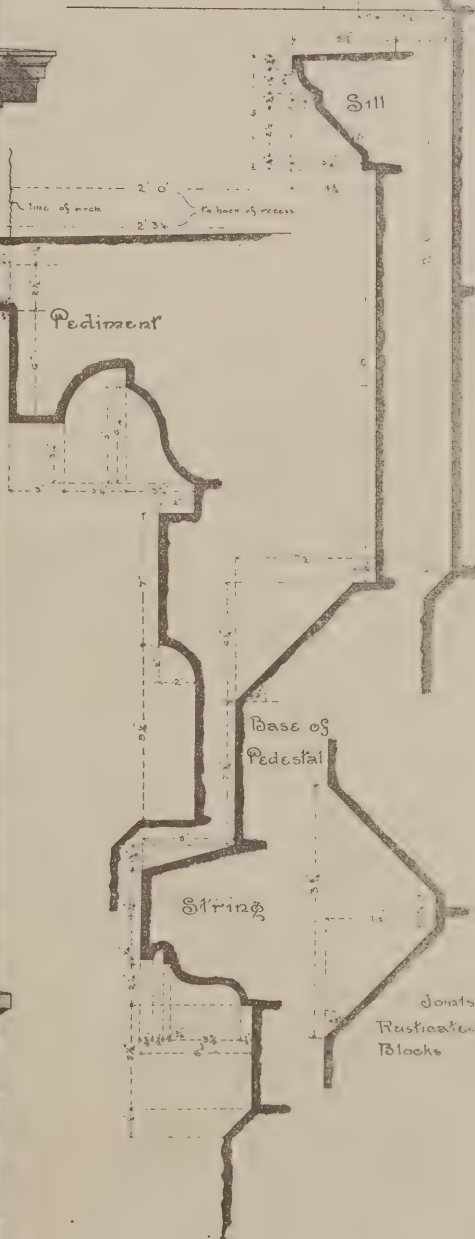
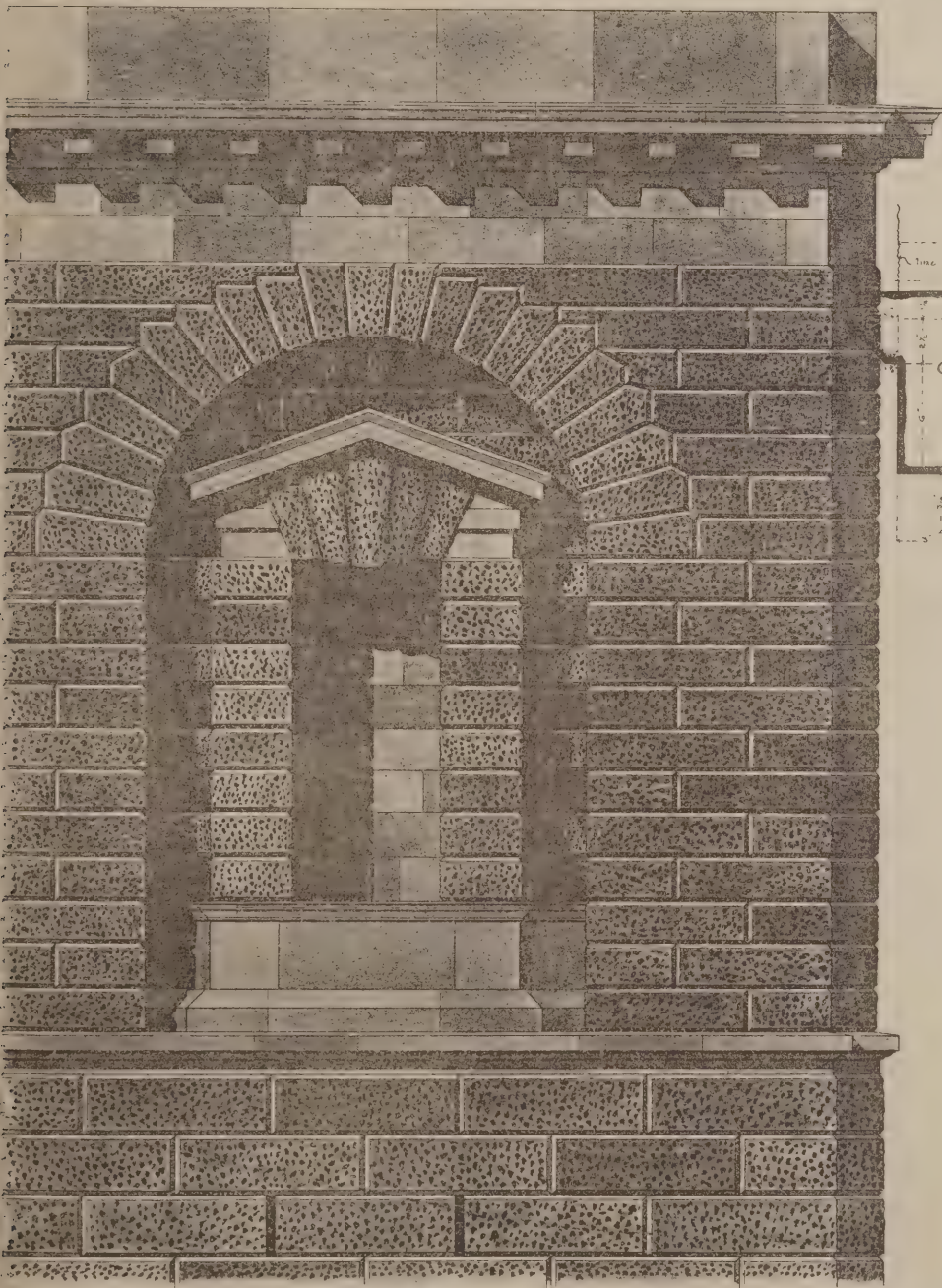
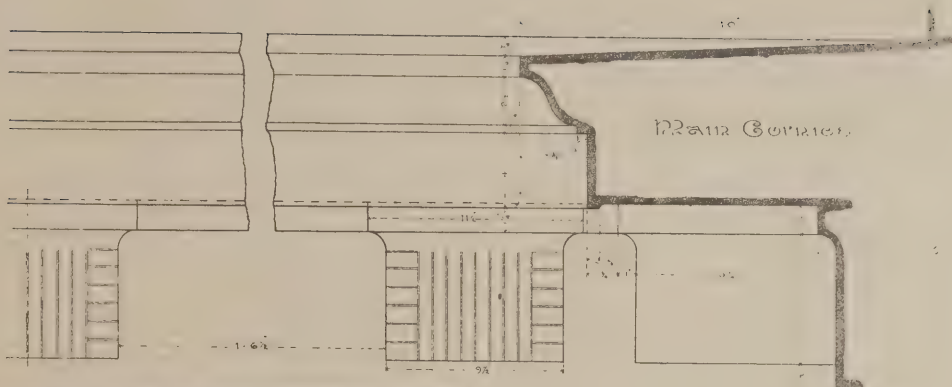
Measured & Drawn
by
W. Campbell O'Neil

NEWGATE PRISON

George Dance (Junior)
Architect

Rebuilt 1770

Detail of Niche



Mouldings

Measured & Drawn
by
W. Campbell Omer.



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SIENA CATHEDRAL: THE PAVEMENT.

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Masters and Men.

The Glasgow Plasterers' Strike has been settled. The masters at a meeting last week agreed to concede the demands of the operatives, and to raise the rate of wages from 9d. to 9½d. per hour.

Master-Builders in the Stourbridge District have given the bricklayers and carpenters notice of a reduction of ½d. an hour in wages. The carpenters ask for an advance of ½d. per hour. The building trade has not been active, but the trade has been helped a little by a reduction in the price of bricks of 2s. 6d. per 1,000.

The Plasterers of Swansea have given notice for an additional ½d. per hour, which will terminate next May. Meanwhile the master-builders, who are now members of the Master-Builders' Association, have submitted to their organization a new code of rules, which fixes the plasterer's wages at 8d. per hour, these rules being given as a counter offer to the men.

The Maidstone Building Trade Dispute.—Mr. G. R. Askwith, who was appointed by the Board of Trade to act as arbitrator in the dispute between the masters and men engaged in the building trade in Maidstone as to the hours of labour, has given his award. The masters had made a new rule to the effect that the men should commence work during the months of December and January at 8 o'clock in the morning and continue working without any break till the dinner hour, and the arbitrator decides in their favour in regard to this. The men, however, succeed in their contention, which was a vital point with the carpenters and joiners, that the

rate of pay for overtime should commence after an ordinary day's work instead of after a ten-hours day as proposed by the Masters' Building Association. The lock-out, which has lasted some six weeks, is now at an end.

Leeds Building Trades Protest against the "Go-Easy" Charges.—At a crowded meeting recently convened by the Leeds Building Trades Federation a resolution was passed protesting against the articles published in the "Times" and other newspapers "to prejudice the public against the workers in the building trades by stating that the trade unions are responsible for the high cost of buildings by a system of organised idleness. Such statements are not facts, and are made with the sole intention of damaging the workers in the minds of the public, answers to them by workers and others defending unionism being so cut up by the Press that in nearly every case the writer does not recognise his own production. This meeting pledges itself to use all legitimate means to counteract the same by circulation to the public of indisputable facts."

COLOUR IN DOMESTIC DECORATION.

AT the Durham College of Science, Newcastle, last week, under the auspices of the Northern District of the Incorporated Institution of British Decorators, Mr. George C. Haité, president of the Society of Designers, delivered a lecture on "Colour, and its Application to Decoration," which was the concluding address of a series on decorative art in relation to house ornamentation delivered in the Midlands, and reported in these columns. Mr. Haité

said there were two systems of decorating ceilings. One was the hand-decorated ceiling, in which every possible outrage that could be imagined was perpetrated, and would continue to be perpetrated. In decorated ceilings by mechanical or manufactured decoration there was not the same possibility, and he was glad that it was so. Figures of human beings should not be used in the decoration of ceilings under any consideration whatever. He had had the Sistine chapel suggested to him as an instance to the contrary; but he believed that Michael Angelo, who painted that ceiling, would have protested, and did protest, against placing the human figure in positions in which it could not possibly be seen, unless they lay on their backs in the centre of the room, or at one particular point. As regards ceilings decorated by the aid of manufactured material, it was not by the mere application of the material, but by its use and adaptation that a decorator deserved the name. A completely satisfactory decorative effect would be practically impossible unless the ceiling were decorated or coloured. If the ceiling be left white, it set up discords, instead of being in harmony. In his opinion, strong colour could be used more satisfactorily on the ceiling than on any other portion of the room, inasmuch as it had no background, no pictures and no furniture. After speaking of colour and colour theories, Mr. Haité said he objected to varnishing, and said that decoration might best be keyed up by making the doors or overmantels brilliant in colour. A colour should not be too pronounced; it was objectionable to have four or five colours announcing the fact. Decorators would find that they could often pull a scheme of colour together by the various colours so designed that they appeared to the



THE SOUTH WALL, NEWGATE, FROM OLD BAILEY.

observer to be a single colour. He spoke of the excellent influence of colour upon national character. Good colouring would dissipate half the worries that troubled people, which would seem trivial and unimportant. Depression was caused by the leaden hue of the skies and the monotonous grey of the streets. The introduction of trees into the thoroughfares of our cities had increased the joyousness of life and given us a greater and wider sense of beauty. He pleaded for tessellated tiles, and for coloured glass and bricks in façades of buildings. He pleaded also for colour in dress. Colour should be broken by colour, and not by neutrals—not by gold, silver, black or white. As photography was neither an art nor a science, but a connecting link between the two, so decoration might be said to be the connecting link between architecture and painting. It was both an art and a craft. It required many qualities, depending as it did upon construction for its existence and relying upon the treatment and selection of colour for its satisfactory expression.

Keystones.

Old Gateway in College Street, York.—The drawing of this gateway on p. 443 of our last issue was by Mr. W. Ainsley, not "Ainsler" as printed.

A New Volunteer Drill Hall at Twickenham has been opened. The building is a substantial brick structure capable of seating 600 or 700 persons.

St. Matthew's Church, Bayswater, has undergone several important additions within the last few weeks. These include an altar rail with ten massive brass standards, an oak altar table and carved platform, and a sanctuary carpet, as well as umbrella holders throughout the church.

An Important Archaeological Discovery has been made at Mount Jener, near Guéret. About two yards under the surface an excavating party came on a fortified Gallo-Roman camp in excellent preservation, three buildings, almost intact, enclosing funeral urns, pottery, bones, money and medals.

Mr. John Cresswell has resigned his position as county architect to the Northumberland County Council. He was led to this step by the feeling that he was no longer physically competent to perform the increasingly arduous duties of the office. Mr. Cresswell had been county architect for twenty-three years.

A Sheffield Memorial to Queen Victoria.—The movement for perpetuating the memory of Queen Victoria in Sheffield took final form last week, when the design of Mr. Alfred Turner, of Kensington, for a bronze statue on a stone pedestal was accepted. The memorial is to cost something over £3,000, and is to stand on an open space opposite the Town Hall, now occupied by a monolith erected in the Jubilee Year. This is to be moved, probably to one of the parks.

Westminster Abbey Fees in connection with the Ruskin medallion, as stated on p. 456 of our last issue, amount to £201 1s., which is not far short of the cost of the medallion itself. It appears that these fees are made up as follows:—One guinea goes by custom to the Clerk of the Works, who superintends the fixing of the monument; and £200 is placed to the Fabric Fund, this, too, in accordance with custom. The rapid deterioration of the fabric which is caused by the London atmosphere throws a burden upon the funds at the disposal of the Chapter which is all too heavy for them.

A Stockport Competition.—The Town Hall Committee of the Stockport Corporation have offered five premiums to the architects competing with designs for the proposed new town hall. The premiums are to be awarded according to the merits of the designs as determined by an assessor, namely, (1) £100, (2) £75, (3) £50, (4) £50, (5) £50. The president of the Royal Institute of British Architects has been requested by the town clerk to advise the Corporation in the appointment of a professional assessor to adjudicate upon the designs sent in. The Committee has expressed the opinion that a sum not exceeding £60,000 should be the limit of expenditure on the erection of the new town hall.

New Wesleyan Schools at Witton have been opened in Griffin Street.

A New Workhouse Infirmary at Rochdale has been erected at a cost of £26,000. The architect is Mr. Butterworth.

A New Lych-Gate for the parish churchyard of Walford-on-Wye, near Ross, has just been completed in memory of the Rev. G. Robinson Kewley, who was vicar of the parish from 1884 to 1887.

A New Free Library was opened last week as a memorial of Queen Victoria's Diamond Jubilee at Wolverhampton. The building has been erected from the plans of Mr. H. T. Hare, of London. The old free library buildings are to be used as a technical school.

New Municipal Buildings at Llandudno have been opened. The site was given by Lord Mostyn in commemoration of the completion of the sixtieth year of the reign of Queen Victoria. The buildings were designed by Mr. Silcock, and the cost of construction will amount to about £23,000.

The University Correspondence College Calendar, 1901-1902, has just been issued by Mr. W. B. Clive, price 1s. nett. During the year ending August 31st last 926 students of this college passed the London University examinations; in fact, the number of successes of the College at London University has increased nearly 30 per cent. during the last six years. At M.A. 1901 the students formed exactly one-half of the Pass list.

Additional Inspectors of Buildings in Manchester.—The Improvement and Buildings Committee of the Manchester City Council have appointed a buildings inspector to fill a vacancy recently occurring. There are only three inspectors in Manchester, whereas in Sheffield there are eight and in Liverpool eleven. The opinion was expressed that until it will be definitely known whether or not the township of Stretford is to be incorporated in the city it would be inadvisable to make further appointments at present.

Mr. James Stevens, F.R.I.B.A., died recently at the age of seventy-five. For over forty years he carried on business in Manchester. Many important warehouses and hotels in the city have been built from his designs, whilst at Macclesfield most of the public buildings are his work, including the free library, the school of arts, the infirmary, the technical school, the industrial school, and the more recent part of the town hall. Very recently, too, he designed the Crewe technical school. Mr. Stevens was a past president of the Manchester Society of Architects.

The New Buildings of the Leeds Trades Council in Upper Fountains Street are now approaching completion. The buildings, which are being erected by the Leeds Builders Company, according to the designs of Mr. W. S. Braithwaite, architect, comprise a large hall capable of accommodating 450 people, a smoke-room and bar with a billiard-room, reading-room, lodge-rooms and offices. The adjoining building, occupied by the National Union of Boot and Shoe Operatives, also forms part of the Trades Council premises, and will shortly accommodate the Gasworkers and General Labourers' Union. The new buildings, which are constructed of brick with stone dressings, will cost some £6,000.

A New Town Hall at Thetford has been erected from plans by Mr. H. J. Green, A.R.I.B.A., of Norwich. The front elevation is from the Market Place, and there is also an elevation from Cage Lane. The stone work throughout is of Ketton stone, and outside white Cossey bricks are conspicuous. Messrs. E. Wilmott & Sons, of Cambridge, have been the principal contractors for the building. The sub-contractors include—stonework, Messrs. R. Hall & Son, of Thetford; plastering, Mr. W. G. Crotch, of Norwich; ironwork and hot-water fittings, Messrs. Barnes & Pye, of Norwich; clock, Mr. W. H. Harris, of Thetford; county court fittings, Messrs. Trevor, Page & Co., of Norwich; mosaic work, Mr. J. F. Ebner, of London; electric lighting, Messrs. D. Brown & Co., of Newcastle-on-Tyne; ventilating pipes and details, Exors. of the late Mr. W. Clarke, of Thetford. The gross total cost, including architect's fees, clock, electric lighting, and other accessories has been estimated at £10,000.

An Architect's Bankruptcy.—In the Birmingham Court of Bankruptcy last week Mr. Herbert J. Greatrex, architect, of 121, Colemore Row, Birmingham, was adjudicated a bankrupt.

Mr. Edwin B. B. Newton, F.S.I., A.M.I.C.E., F.G.S., has been promoted from the position of assistant surveyor to the Paddington Borough Council to that of borough surveyor.

The Theatre of Merida, Mexico, is to be decorated with large paintings by M. Guidi representing "Mexico crowned by Progress—accompanied by a Cortège of the Arts and Sciences, Industries and Commerce."

The Church of St. Martin's-in-the-Fields is likely to be the city church for Westminster, at which the mayor, aldermen and councillors will have seats. The church, by Gibbs, dates from 1721.

Mr. E. W. Barnes, architect, of Guildhall Chambers, Broad Street, Bristol, died recently at the age of fifty-seven years. Mr. Barnes was a member of the Bristol Society of Architects and a Fellow of the Royal Institute of British Architects.

Mr. Hugh Stannus, director of architectural studies at the Manchester Municipal School of Technology and the School of Art, lectured last week on architectural history in the new school in Whitworth Street. This was the first public event which took place there.

Progress of Piccadilly Widening.—The London County Council hopes to complete the widening of Piccadilly about the middle of next month. Since the amended scheme received the sanction of the Crown, the Council has pushed forward the work with alacrity, and practically all that remains to be done now is to complete the surface of the new roadway that is to form part of Piccadilly and to plant the proposed new trees.

Bristol Society of Architects.—At the meeting of this Society held last week, Mr. Frank W. Wills (president) in the chair, a paper was read by Mr. Alfred H. Dykes, A.M.I.C.E., M.I.E.E., of Westminster, on "Electricity as applied to Buildings." The lecturer confined himself principally to the consideration of the alterations in the design of factories and works necessitated by the increasing use of electrical energy, and he also spoke of the systems of distributing current inside buildings.

The Competition for a New Art School at Hull, to be erected at a cost of £12,000, has been decided. No fewer than eighty-seven sets of plans were sent in. Mr. Sydney R. J. Smith, London, the assessor appointed to adjudicate, has given his award as follows:—1st, Messrs. Lanchester, Stewart & Rickards, 1, Vernon Place, Bloomsbury Square, London, W.C.; 2nd, Messrs. Spencer W. Grant & James A. Bowden, Moorgate Station Buildings, 63, Finsbury Pavement, London, E.C.; 3rd, Mr. F. J. Smith, Parliament Mansions, Victoria Street, Westminster, London, S.W. The Art committee, before formally adopting any of the plans from which the new school will be built, have decided to have an interview with the winners of the first premium.

"Notes on Some Yorkshire Churches."—This was the title of the lecture which Mr. Charles Hadfield, F.R.I.B.A., delivered last Thursday before the Sheffield Society of Architects and Surveyors. After referring to the parochial system which followed on the great changes after the reintroduction of Christianity in the seventh century, Mr. Hadfield proceeded to notice the following parish churches:—Rotherham, Treton, Handsworth, Aston, Ecclesfield, Sheffield and Laughton-en-le-Morthen. He gave outlines of their history from Domesday and other sources, and described by aid of plans which he had prepared the date and mode of their construction. The surveys of most of them were prepared during works of repair done by himself during the past thirty-five years. The influence exercised upon the art of the district by the great Archbishop Scott of Rotherham, a native of either Rotherham or Ecclesfield, was pointed out, and allusion was made to his college at Rotherham and his work in rebuilding the church there.—In the course of the evening it was announced that the R.I.B.A. prize drawings would be on exhibition at the Howard Art Gallery from February 25th to 28th inclusive.

Correspondence.

Architectural Examinations.

An architect having written to Mr. Seth-Smith, the president of the Architectural Association, for his opinion on an examination recently instituted by the Society of Architects, that gentleman has replied by the following letter:—

February 3rd, 1902.

My dear Sir,

As to the Society of Architects to which I at one time belonged. It had a mission, namely, that of calling the attention of the profession and the public to the need (in its judgment) of the legal protection of the title of "Architect," and of compelling those who in future aspired to the calling to have gone through proper and sufficient training.

The first principle the Council originally laid down was that the Royal Institute of British Architects was the proper examining body and that in any Bill it (the Society) advocated the Institute should be the sole examining body for England. On these bases I supported the movement, for the reason that the Royal Institute of British Architects in their new charter had apparently ignored or abandoned this broader policy, the only policy which, to my mind, can secure to our profession its due status or to the Royal Institute of British Architects its widest usefulness.

When, however, some eight or more years ago the Society of Architects launched a scheme for examinations of its own, after using all my powers of persuasion to no avail, I was obliged to resign my membership, and I shall continue to oppose the policy it is pursuing by every possible means, excepting that I am, of course, as strong (and even stronger) an advocate of the legal registration of every properly-qualified architect as ever I was, and am pleased to notice how rapidly the necessity for something of the kind is forcing itself on the minds of most architects.

I am, dear Sir,

Yours very truly,

(Signed) W. H. SETH-SMITH.

Engineering Notes.

The Isolation Hospital, Maidenhead, is being warmed and ventilated by means of Shorlands' patent Manchester stoves, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

The E.L.E. System of Electric Lighting.—In answer to the numerous communications received, the directors of Electric Lighting Boards (British Manufacturing Co.), Ltd., request us to announce that all enquiries, correspondence, &c., should be addressed to the head office at No. 7, Pall Mall, London, S.W., and addressed to the Company as distinct from individuals.

"Tube" Vibration.—The report of Lord Rayleigh, Sir Wolfe Barry and Professor Ewing, the Committee appointed by the Board of Trade to enquire into the cause of the vibrations in adjacent buildings made by the Central London Railway, refers the cause to the magnitude of the load, 8 tons, carried on each of the 4 axles of the locomotives, making 32 tons in all, unrelieved by springs in order to obviate the necessity for gearing, and to the unevenness of the surface of the rails. They conclude that if a method of driving is adopted by which the unsprung-borne load on the axles is reduced to a small quantity a practically complete cure will be effected. The motor-cars were found to have an advantage over the locomotives. They recommend that in new undertakings sufficient room should be allowed for the introduction of a deeper rail.

The New Rodin Pavilion at Meudon, though built with the materials of the old one, is somewhat different in design from the gallery so well known to visitors to the Paris Exhibition. The old entrance has been replaced with a strong colonnade in the Louis XIV. style, and the rotunda has given way to a rectangular vestibule. The "Porte de l'Enfer" done for the Musée Galliera and rejected will find a corner in the pavilion.

Builders' Notes.

Mr. George Rae, builder, of Balmedie, died last week in his seventy-fifth year.

The Master-Builders' Association of Ireland held its annual dinner recently. The president, Mr. J. Beckett, occupied the chair.

Mr. Frederick Thorn, who for many years carried on the business of a builder and decorator at Portsmouth Road, Long Ditton, died recently at the age of fifty-seven years.

The Edinburgh and Leith Master-Builders' Association held its annual meeting last week. The following office-bearers for the ensuing year were re-elected:—President, Mr. Robert Lamb, builder; vice-presidents, Mr. Patrick Knox, plumber, Mr. M'Leod, builder, and Mr. Alexander Calder, joiner; secretary and treasurer, Mr. John Nicol.

The Portsmouth Master-Builders' Association held its annual meeting recently, Mr. W. J. Light presiding. Mr. Light was re-elected president, Mr. W. W. Evans was re-elected vice-president, Mr. Henry Jones treasurer, and the following as committee:—Councillors Dye and Porter, Messrs. James Crockerell, J. W. Perkins, H. G. Wilkins, G. R. Chamberlain, G. J. Davis and A. Spriggs. Messrs. E. Bradshaw and J. Harding were elected auditors, and Mr. Frank J. Privett was re-elected secretary.

The Hull Branch of the Yorkshire Federation of Building Trades' Employers held its annual dinner last week. The chair was taken by the president, Mr. E. Good. Mr. J. Watson (Hull) said, in reference to the depression in trade, it would be better, instead of decreasing wages, to weed out the inferior workmen. Mr. J. Dawson (Huddersfield) said the Yorkshire Federation had long ago passed a resolution asking its members not to reduce wages unless they were absolutely forced, but to try to do away with those restrictions the men demanded of them by their interference with the liberty of action.

London County Council.—At last week's meeting of the Council the Water Committee brought up their report on the London Water Bill and recommended (a) that the interests of the people of London ought not to be entrusted to a Water Board nominated by seventy-eight different authorities and independent of public control: a recommendation which was adopted on a division. It was further resolved: "(b) That it is inexpedient and dangerous that a Board constituted as proposed should have the power to decide by agreement what sum shall be paid to the companies, or that it should have the right of creating debt or of levying rates on London. (c) That the Council should endeavour to obtain such amendment of the financial provisions of the London Water Bill, 1902, as shall make it clear that the award of the arbitration tribunal is to represent the fair and reasonable value of the undertaking, and is to be determined as a sum of money."—Mr. Austin asked the chairman of the Finance Committee whether an offer had been received from a contractor to undertake the jobbing works of the Council at 1½ per cent. below the present schedule price. Lord Welby said that something in the shape of negotiations had taken place as to whether such an offer might be entertained. He did not like at the present moment to say that such an offer had been actually made. Mr. Burns, M.P.: In the event of such an offer being made I suggest that before accepting it the Finance Committee take steps to enquire whether the offer was a *bona fide* one and if the loss, if any, is not guaranteed by a pool of master-builders who want to break up the Works Department. Lord Welby was understood to reply that the *bona fides* of any contractor making such an offer would be the subject of enquiry.—A report from the General Purposes Committee recommended: "(a) That an advertisement be issued inviting applications for the appointment of manager of works, and that the salary to be attached to the position be £1,500 a year as at present; (b) that a standing committee, consisting of seven members, be appointed for the supervision of the Works Department and that such committee be styled the Works Committee." The discussion on these matters was postponed.

The L.C.C. Works Department.—Mr. William F. King, president of the London Master-Builders' Association, denies that builders have formed a

pool to guarantee a contractor against possible loss in the event of the jobbing work of the L.C.C. being placed in his hands. No action, he says, has been taken either by members of the Association or by any ring of builders with a view of influencing the contracts of the L.C.C. or of its Works Department in any way at all. Some years ago the Association certainly gave an opinion that the L.C.C. could not successfully conduct a Works Department except at great loss to the ratepayers, and this opinion appears to have been justified, otherwise they had always recognized the L.C.C. Works Department as a building firm and have assisted them on many occasions with technical information.

New Patents.

These patents are open to opposition until March 22nd.

1901.—Fanlight Openers.—3,412, R. ADAMS, 67, Newington Causeway, London, S.E. An arm is fixed to the frame of the fanlight and is pivoted at its outer end to a right-angled lever. One end of this latter is arranged to slide in a slot, or in a slotted bar fixed to the sash, and the other end is suitably connected to a vertical operating bar fitted with screw gear.

Safety Gear for Electric Lifts.—4,123, C. W. HILDRED and R. WAYWOOD & Co., LTD., both of Newington Iron Works, Falmouth Road, London, S.E. The gear is double acting. It is automatically brought into play if the cage or balance-weight meets with an obstruction, causing the ropes to become slack, or in case they break; and the device is also designed to be brought into action should the cage go too fast, when the circuit is broken and the motor stopped, and in some instances bringing safety catches into operation.

Woodite.—17,431, W. WOOD and H. BARTLETT, both of Mitcham, Surrey. Woodite consists of—washed Para rubber, 80 parts; fucus vesiculosus, 10; wood pulp, 5; and mastic or resin, 5. Sulphur is added for vulcanising.

The following specifications were published on Thursday last, and are open to opposition until March 29th. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1900.—23,462, WAYSS & FREYTAG, moulding machine for electric conduits.

1901.—1,070, SCOTT-MONCRIEFF, sewage distributing apparatus. 1,552, OLDFIELD & SCHOFFIELD, planing, shaping and other machines having a quick return. 2,230, SCHINZER, disinfecting apparatus for water-closets. 4,033, HADDAN (*Stigler*), controlling apparatus for electric lifts. 4,537, DUNBAR, FORD & FORD, water-closets. 4,742, BLADON, ventilators. 4,756, GILBRETH, concrete mixing apparatus. 5,758, DISS, pug-mills. 5,952, HIRST & BACON, water-tight cover for electric cut-outs, joint boxes, &c. 6,255, CULVER, taps. 10,831 FISCHER, pipe connections. 10,937, WORTHINGTON, latch lock for gates. 13,022, BOMMER, spring hinges. 16,249, STEPHENSON & ROBINSON, overflow and discharge wastes for lavatory basins, baths, &c. 20,896, BRICE, kilns. 22,909, BOLLE (*Lagino*), erecting jointless walls. 24,139, SCHECK, roofing sheets. 24,184, CRACOANU, fireproof floors. 24,292, ATCHER, cramps. 25,316, BENNETT, tiles for floors, walls, &c.

A Baptist Church and Schools at South Bank, Yorkshire, is to be erected, and the designs submitted by Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines have been accepted. The accommodation provided in the church is for 542 adults. The estimated cost is £4,380.

The Monument of Bossuet which is to be erected on the site of the now ruined choir of the church of St. John, Dijon, will represent the orator in an attitude serene and dignified rather than declamatory. M. Paul Gasq is the sculptor. The subject will be supported by the two allegorical figures of Eloquence and Faith on which M. Mathurin Moreau is now engaged. The whole work will be executed in the fine warm-tinted stone of the country.

Law Cases.

A Morecambe Architect's Claim.—At the Manchester Assizes last week Mr. Justice Bucknill heard an action in which Mr. Herbert Howarth, architect and surveyor, of Morecambe, sought to recover from Messrs. John Gardner and John Scott, proprietors of the Alhambra Palace, Morecambe, £379 6s. 8d., balance of an account for services in connection with the erection of the Alhambra. The defence was that the plaintiff did not render certain services for which he claimed, that the commission to which he was entitled, and which he had been paid, was 5 per cent. on £22,581 10s. 6d., and not upon £25,799 which the plaintiff claimed. Negligence was also alleged, and for this £230 was claimed. Mr. John Scott, builder, Morecambe, and one of the defendants, said he and his partner declined to pay the plaintiff any commission on the electric light, decorations, colouring and gilding, plastering, draperies, seats, and so on, because he had nothing to do with the work. Mr. Gardner, the other defendant, was unable to attend, and his Lordship adjourned the case *sine die* for his attendance, the costs of the action occasioned by his non-attendance to be paid by the defendants' solicitor to the plaintiff's solicitor forthwith.

An Important Point in regard to Building Frontages.—At the Bristol Police Court last week the case of the *Bristol Corporation v. the Bristol Brewery Co.* (Messrs. Georges & Co.) was heard. The action arose through the defendants having omitted to rebuild the front of a public-house, known as the Jolly Colliers, in West Street, Bedminster, after pulling down a portion of it, in accordance with the provisions of the Improvements Acts, 1840 and 1847. In delivering judgment Mr. G. E. Davies explained that the alterations had given the Corporation the right to demand that the premises should be pulled down and rebuilt to a certain line laid down by the city surveyor. They found that such demand had not been complied with. The principal question to be decided was whether the stone window sill which was removed constituted any part of the front or external wall, gable or outer boundary of the premises. In determining that point the magistrates did not consider themselves helped in the slightest degree by the opinions of expert witnesses, as gentlemen of equal standing gave contradictory opinions in the witness-box, according to the side which called them. After viewing the premises, they had come to the conclusion that the sill must be considered part of the front or external wall. They were therefore of opinion that such alteration was made to the external wall as would give the Bristol Corporation the right to demand that the owners should set back their premises in the manner demanded. They did not think that the defendants intended to give instructions that the sill should be removed, but their instructions on that point were not explicit. Under these circumstances, although they had given judgment in accordance with law, they thought it bore with great hardship upon the defendants, and the justice of the case would be fully met by inflicting upon them a fine of 6d. Leave to appeal was granted.

Stonehenge is proposed to be acquired as a national monument. The Wiltshire County Council make this recommendation to the Government and state that they are willing to undertake the guardianship.

Indian Archaeology.—Mr. J. H. Marshall has been appointed Director of Archaeology in India. A Government resolution announces that an annual provision of one lakh of rupees will be made for the preservation of ancient monuments, and urges that the provinces should also fix annual payments for this purpose.

A New Isolation Hospital is proposed to be erected at Meltham Moor, Huddersfield, and a Local Government Board enquiry was held recently by Mr. F. St. George Mivart, M.D., the Board's inspector, into an application of the West Riding County Council for sanction to borrow £23,744 for the purpose. Mr. Joe Berry, architect, has prepared the plans.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Right of Surveyors to Dispose of Plans.

MANCHESTER writes: "If an architect sends to a district council a set of plans with his name on them and both his own and the client's on the building form, has the surveyor any right to give those plans to the client, if he should call at the council's offices and say he did not want them to be passed?"

The surveyor has no right to hand over the plans in the way you mention and you can sue him and the client for the recovery of the plans. The client must also pay for the work done.

"Goodwill" of Architect's Practice.

YORKSHIRE writes: "A local architect just deceased has left his practice in the hands of his executors. Deceased has a son in practice in Yorkshire, who is considering whether to combine this with his own practice or not. In case he declines to take the deceased's practice, I have the option of stepping into it. Is there in the profession the equivalent to the commercial 'Goodwill,' and on what basis should the value of such a transfer be made?"

The goodwill is usually taken at three years' purchase for that portion of which the clients are regular customers for fresh work. The commissions which depend upon an architect's personality or influence are valueless to another. The valuation is somewhat difficult, and differs in each case; it is best, therefore, to engage a professional valuer.

Deductions from Account and Charges for Extra Material.

IPSWICH.—W. H. D. writes: "(1) Can an architect deduct anything for inferior joinery work, if he has allowed it to remain in the building? (2) Can I charge for 200ft. cube of timber used in excess of the quantity in the bill of quantities, which was prepared and supplied by the architect himself? The contract I signed was that agreed on by the Master-Builders' Association."

(1) The contractor must accept whatever the architect deducts or he can be ordered to replace it according to the contract. (2) If the timber was shown on plans or stated in the specification, or was necessary to the due completion of the work, you cannot claim anything. If you have given a clean receipt (without proviso) in full settlement of account we cannot see how you can reopen the question.

Right to make Openings into Lane.

TREHARRIS.—OLD SUBSCRIBER writes: "A. is the lessee of a plot of land (possession of which he has had for fifteen years) which is situated on the boundary of property composed in an estate. The adjoining land was undeveloped at the time the lease was granted, and remained so for many years after. Subsequently the adjoining land in question was developed, and for the purpose of such development a 'back lane' was constructed immediately adjoining A's boundary wall. The lane is publicly used, although constructed for the benefit of the occupiers of the houses built on the adjoining estate. It has not been taken over by the local authority, although its construction was sanctioned by them. Can A. make an opening in his boundary wall giving ingress and egress to and from the lane? Can the lessors or any of the lessees of the adjoining estate obstruct his right to make such an opening?"

I gather from your statement and the accompanying diagram (not reproduced) that the passage marked "lane" "is publicly used." From this and the fact that there is no gateway in any way shutting it off from the public highway of which it apparently forms a part I infer it has vested in the local authority as a public

thoroughfare or right of way. If my inference is correct I see no objection whatsoever to A. making an opening in his boundary wall giving ingress and egress to and from the lane, and under the circumstances I have pointed out the lessees of the adjoining estate can in no way hinder him. Although you state that you have been in possession of the plot for fifteen years, yet you do not say whether or not you have during the entire (or indeed any) portion of that period exercised rights of ways over the ground now occupied by the lane.

W. JOHNSON-ROBERTS.

St. George's Hall, Liverpool.

LONDON, S.W.—H. S. writes: "Have any plans been published of St. George's Hall, Liverpool?"

I believe that the plan and an elevation of St. George's Hall, Liverpool, were published with the second volume of "The Civil Engineer and Architect's Journal" in 1839 by J. Weale, publisher, 59, High Holborn, whose business I understand is now carried on by Mr. B. T. Batsford, 94, High Holborn. But perhaps a more readily obtainable work would be "The Stranger's Guide to Liverpool," by David Thompson, M.D., and published by Messrs. Ward Lock in 1854. This gives a plan and perspective view of the Hall, with a short description; it was published at 1s. 6d. Both these works, together with numerous plans and tracings, are to be seen at the Royal Institute of British Architects, Conduit Street, W.

G. A. T. M.

Open Timber Floor.

LONDON, W.C.—E. B. M. writes: "Kindly describe how an open timber floor plastered between the joists is constructed. I want it as thin as possible consistent with strength. Several architects advise the joists and beams to be laid flat. Would this give sufficient strength?"

The strength of a loaded beam such as a joist or girder varies directly as the breadth and inversely as the length. The depth is therefore the most important part, and no practical architect could advise joists being laid flat. The proportion for joists and beams with the minimum amount of material will depend upon whether strength alone is considered or strength combined with stiffness. If the breadth of a beam exceeds half the depth it will not be an economical distribution of material for strength, and if it exceeds one-third of the depth it will not be economical for stiffness. Generally, market sizes have to be used leading to the use of 7 by 2, 9 by 3, 11 by 4, &c., but where it is desired to keep the floor thin the depth is reduced and the breadth largely increased. For instance, 7 by 2 joists have a comparative value of $2 \times 7^2 = 98$, with a section of 14 sq. in., while 6 by 3 joists have a comparative value of $3 \times 6^2 = 108$, with a section of 18 sq. in. and 98 : 14 :: 108 : 15.43, showing a loss of $100 \times \frac{108}{15.43} - 100 = \text{say } 16\frac{1}{2}$ per cent.

Beams are as a rule made much wider in proportion than joists in order to save depth, but the same theoretical objections apply. In the case given the area supported by each beam is say 14ft. 6in. \times (5ft. 9in. + 3ft. 3in.) = 130.5 sq. ft., which at $\frac{1}{4}$ cwt. per sq. ft. total load = say 163 cwt. distributed. The formula for safe distributed load in cwts. on a beam is $w = \frac{bd^2}{L}$, therefore $163 = \frac{bd^2}{\text{say } 15}$, or $bd^2 = 163 \times 15 = 2445$. Suppose the depth to be 12in., then the breadth will equal $\frac{2445}{12^2} = \text{say } 17\frac{1}{2}$ in., which

would be extravagantly out of proportion. Taking a depth of 13in. the breadth would be $\frac{2445}{13^2} = \text{say } 14\frac{1}{2}$ in., so that a piece of whole memel 13½in. sq. would be suitable and would have the adzed faces preferred for such work. Assuming the joists to be 15in. centre to centre, each one would have to carry over the centre span $11.5 \times 1.25 = 14.375$ sq. ft., or say 18 cwt., and would require a scantling of $bd^2 = 18 \times 11.5 = 207$, which would be provided by joists 7 by 4½ or 8 by 4. To carry the soffit, plastering fillets may be nailed to each joist and laths to the

HENRY ADAMS.

Covered Passage on First Floor.

LONDON, W.—B. P. writes: "A staircase in a house needs to be connected with a side wing. It is proposed to throw a passage across the yard beneath, leading from the old staircase window. Would a 9 by 3 wood joist be strong enough spanning across the 12ft. yard, built into the wall of the side wing, and resting on a 9 by 4 post which is let into the cement of the yard beneath and is bolted to a cross piece (9 by 3) let into the main staircase wall? Would the post require any foundation, and what would be the simplest mode of making a water-tight joint, as it passes through the slate roof of an outhouse beneath? I enclose sketch (not reproduced)."

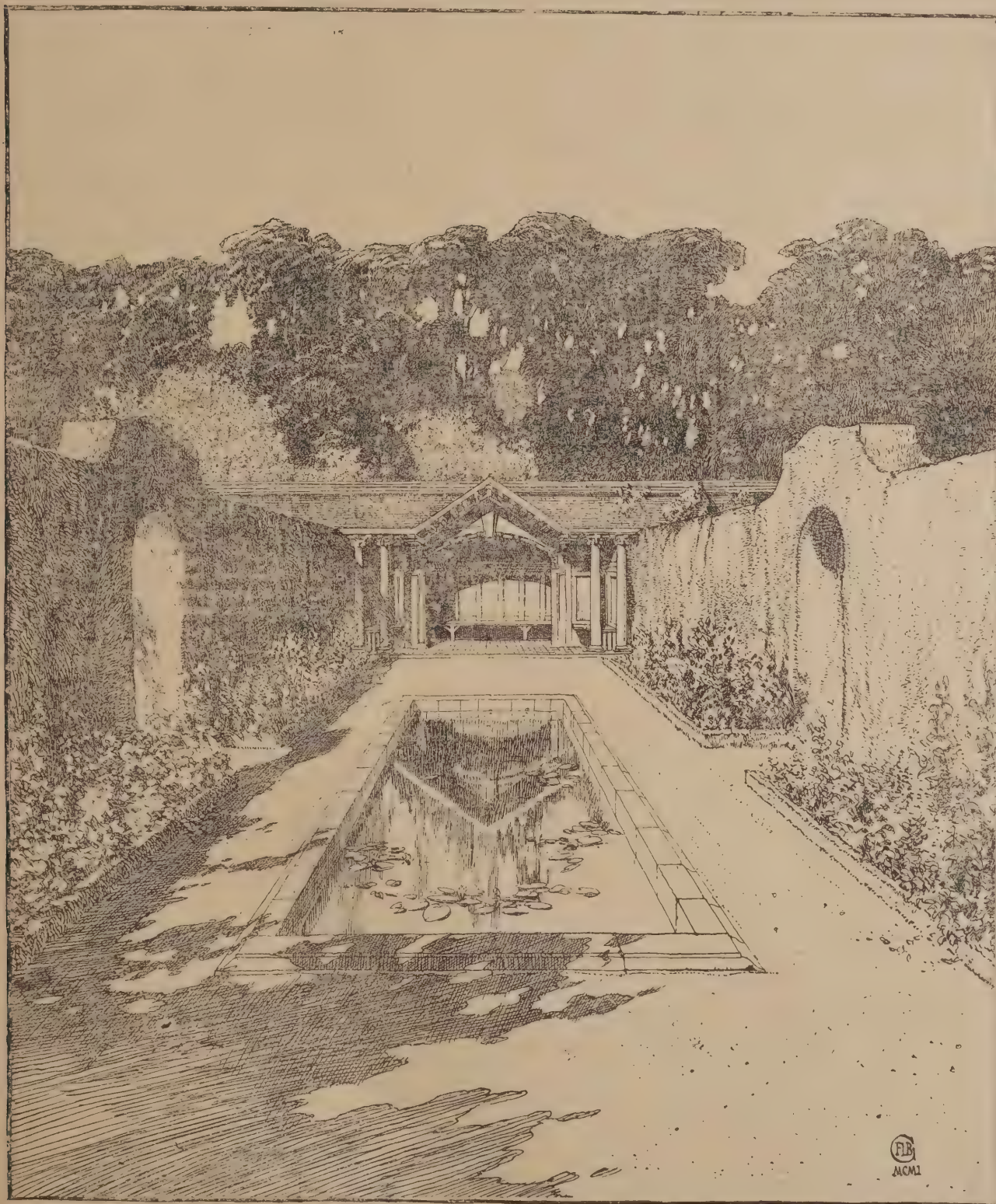
The post for supporting this passage should be not less than 9 by 6 and rest upon an oak sill about 9 by 3 and 3ft. long. The proposed 3 by 9 joist for carrying front of passage should not be less than 9 by 6. The 1½ in. flooring would carry itself across 3ft. 6 in. span without joists, but there would then be some difficulty with the top step for landing which projects into the passage. This could be arranged by a trimmer bolted to wall with distance pieces on each side to set it back to clear the top riser. A water-tight joint can easily be made where the post passes through outhouse roof by 5lb. sheet-lead flashing, the lead being carried under the slates on the upper side. The roof of passage may be 1½ boarding covered with lead or zinc. The fillets

shown on existing transom of window will do if the wall plate carrying roof is continuous past the window and door openings.

HENRY ADAMS.

The Cause of the Belfast Mill Disaster was stated at the inquest held last week to be due to the collapse of two brick piers which rested on the ground floor and supported the upper structure.

Garden Shelter and Lily Pond, Biddenham.—The pond shown in this design was omitted in the completed scheme. It was intended to be placed between the tennis lawn on the right and the kitchen garden on the left, the arched openings in the yew hedge leading to these parts.



GARDEN SHELTER AND LILY POND, BIDDENHAM. C. E. MALLONS AND GROVER, ARCHITECTS.
DRAWN BY F. L. B. GRIGGS.

Views & Reviews.

A New Art Journal.

"The Art Workers' Quarterly," the first number of which has been issued, is primarily intended to supply full-sized working designs to craftsmen who do not design their own productions; and also to supply those who may have some knowledge of the principles of design with specimens of sound and wholesome ornamental work from the best historical and contemporary work. The plates presented with the first number include some of sixteenth- and seventeenth-century examples of Italian lace work and leather work, some German illumination of a similar date, and an early French carved walnut panel; while the modern work includes a design for an intarsia panel by Stephen Webb, hammered metal work by W. J. Neatby, a carved oak altar front by Joseph Phillips and an appliqué panel by Lindsay P. Butterfield. The letterpress in the issue includes some remarks on the influence of Morris on British decorative arts of to-day, by J. Scarratt Rigby, and "The Modern Illuminator," by Edward F. Strange. "The Art Workers' Quarterly" is edited by Mr. W. G. Paulson Townsend and is published by Messrs. Chapman & Hall, Ltd., 11, Henrietta Street, Covent Garden. The editorial offices are at 16, Clifford's Inn, Fleet Street. The price of each number is 2s. 6d.

The Pavement of Siena Cathedral.

This book, which is one of the series of "Handbooks of Great Craftsmen" now being published by Messrs. George Bell & Sons, deals in detail with the beautiful pavement of Siena Cathedral, itself one of the most interesting Gothic buildings in Italy. The ornamentation of this pavement, which is that of pictorial representations in marble, not tesserae, was the work of 200 years, during which time many variations from the original design—if such there ever was—were made by the numerous artists who applied themselves to it. Roughly, the scheme consists of five large squares having centre panels extending down the middle of the nave, with five other panels on either side enclosing designs of the various sibyls, of which the Samian sibyl is perhaps the most beautiful. At the junction of transepts and nave is a great hexagonal treatment of pavement, while around are set panels representing the Massacre of the Innocents, the Expulsion of Herod, and other subjects, the apse being decorated in a similar manner. Vasari states that Duccio made a design for the whole scheme, but there is no documentary evidence to support this: in fact Duccio died more than fifteen years before the larger Duomo scheme was finally abandoned, while the earliest date of decorative work is 1369, two years after which the pavement of the nave from the cupola downwards was begun, and among other things was laid out the design of the Wheel of Fortune. The following year the circle containing the emblems of Siena was commenced, this being the only portion of the floor which is tessellated. The decoration scheme went out year after year until the middle of the sixteenth century was reached, by which time the work was finished. Since then many restorations have been made, the whole of the floor having been completely restored between 1864 and 1878, but this later work is more satisfactory than the unsympathetic treatment of the earlier desecrators: some of the old work which had become too much injured to remain *in situ* was removed to the Museum of the Opera del Duomo and replaced by copies. Through the courtesy of the publishers we are able to give in the centre plates a general view of this wonderful pavement.

"The Pavement Masters of Siena," by Robert H. Hobart Cust, M.A. London: George Bell & Sons, price 6s. nett.

The Imprimerie Nationale, Paris, about to be demolished, contains two rooms of great artistic value—the "Salle des Poisons" and the "Cabinet des Singes." The cornice of the first is beautifully decorated, and the door is a fine bit of work. The "Cabinet des Singes" contain nine panels, painted by Huet. M. Berger, president of the Central Union of the Decorative Arts, has asked that these may be placed in the new Musée des Arts Décoratifs, in the Pavillon de Marsan.

R. I. B. A.

BALDASSARE PERUZZI.

By F. W. BEDFORD.

A MEETING of the Royal Institute of British Architects was held last Monday evening, Mr. William Emerson presiding. The deaths of Mr. James Stevens, Fellow, Mr. E. W. Barnes, Fellow, and the Marquis of Dufferin and Ava, Hon. Fellow, were announced. Mr. O. Smith then announced that a fund, contributed to by several members of the Institute and others, had been formed to purchase from Mr. J. K. Colling the drawings which he had prepared to illustrate his well-known book "Details of Gothic Architecture," and he formally presented the drawings to the Institute. Mr. F. W. Bedford then read his paper on "Baldassare Peruzzi," of which the following is a summary:—

Peruzzi was born in Siena in March, 1481, the son of a weaver of Volterra who had settled in Siena. As a youth he delighted in frequenting the workshops of the goldsmiths and others who practised the art of design. At the age of twenty he was appointed assistant to Pinturichio, who was engaged in painting the chapel of San Giovanni. He shortly after went to Volterra and painted a chapel near the Florentine gate, and then was persuaded to go to Rome. Here, entering the workshop of the father of Maturino, he greatly impressed his master and other artists by his power of design and painting. Agostino Chigi, a rich Siennese banker, befriended and supported him while he devoted himself to the study of the architectural antiquities of ancient Rome. During his stay in Rome, from about 1503 to 1522, he painted and designed a great many buildings. He then spent some time in Bologna, whither he had gone by invitation of the wardens of St. Petronio that he might take part in the competition for the completion of that church. From Bologna he was almost compelled to return to Siena to prepare designs for the fortifications of the city. After completing this work he returned to Rome and became engaged on St. Peter's. In the sack of Rome, in 1527, he was made prisoner, was maltreated and shamefully tormented, and lost all he possessed. He was ransomed by the Republic of Siena, and was appointed to superintend the fortifications of that city. In 1529 he was sent by the Pope to help the Papal and Siennese armies in subduing the city. After the war he returned to Rome and became engaged in the erection of various palaces and on St. Peter's. He found time, too, to study astrology and mathematics, and became so expert in the art of perspective drawing as to surpass all other masters of the day. He commenced also a book on the antiquities of Rome, with a commentary on Vitruvius, and prepared many drawings for the illustrations. Many writers speak in eloquent terms of Peruzzi's nobility and modesty of mind, which, however, were imposed upon by his patrons, so that in his old age he was very poor. He died in January, 1537, and was buried in the Pantheon by the side of Raphael.

The author then treated of Peruzzi's architectural works—some still to be seen in Italy, others spoken of by various authors but no longer existing, and others which have been attributed to him. Among the former mentioned were the Palazzo Massimi, admired by Peruzzi's contemporaries and since held to be among the masterpieces of the Renaissance. The beauty of the plan and the refinement of the details have never been surpassed. The cortile of the Palazzo Massimi alle Colonne is one of the most charming in Rome. A still more famous work is the Villa Farnesina, a work which Baron von Geymüller attributes to Raphael. The author dealt with this subject at some length, and showed the weakness of the reasons adduced by Baron von Geymüller in favour of Raphael as the architect. Having referred to a number of other buildings undoubtedly Peruzzi's, or generally attributed to him, the author next discussed Peruzzi's share in the various designs and plans made for St. Peter's. Peruzzi was appointed architect to St. Peter's on August 1st, 1520—less than five months after the death of Raphael—and held

the post until May 6th, 1527, and from 1530 to 1531, and again from May, 1535, to January 6th, 1537, the day of his death.

In Siena, Peruzzi's chief work was the rebuilding and strengthening of many parts of the city walls; he built seven towers or gateways, four of which—the Porta Laterana, the Porta Pispini, the Porta St. Prospero and the Porta Camollia—still remain. His most interesting work in Siena is the Palazzo Pollini, or Celsi—one of the most refined and dignified little palaces in Italy. The Palazzo Turchi, outside the Porta Camollia, was built about the same time as the fortifications and the Palazzo Pollini, for in the cornice, which is of terracotta, Peruzzi has not only used the same enrichments, but has employed the same moulds for the casting. The details of the frieze, architrave and cornice are almost Greek in their refinement. A number of other buildings by Peruzzi, or attributed to him, were referred to. Many of his designs for the church of St. Domenico in Siena are preserved in the Uffizi. Leaving Siena, the author went on to buildings designed by Peruzzi at Carpi, Ferrara, Vallepiana, Viterbo, Bibbiano and Caprarola. Vasari says that "Peruzzi prepared the design and model for the cathedral of Carpi. . . . The structure was built under Peruzzi's direction, and according to the rules laid down by Vitruvius."

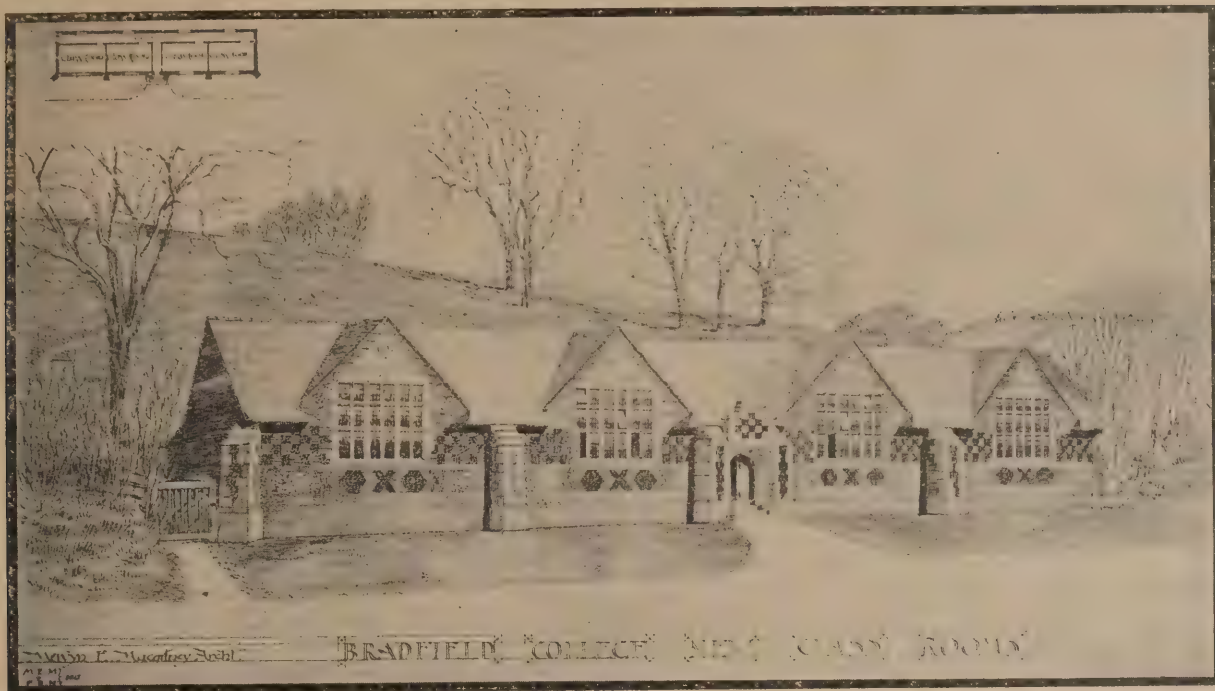
The author concluded with some remarks on Peruzzi as a painter. His paintings were classed with the best of his day. Most of them were executed as fixed decorations, and very few of his easel pictures exist. The influence of Pinturichio, doubtless his first master, is seen in all Peruzzi's paintings. Later he owed much to Sodoma and to Raphael. Some of his most celebrated paintings are those in S. Maria della Pau. They were done in 1515 or 1516, and are strongly influenced by Sodoma and Raphael. The paintings in the Villa Belcaro, which belong to Peruzzi's later years, are among his best and show great decorative power. They are dated 1535.

Peruzzi is said to have been the most elegant painter among the architects, and the most ingenious architect among the painters. He was unfortunate in that he happened to live at the same time as the three greatest geniuses of the Renaissance—Bramante, Raphael and Michelangelo—whose influence permeated the whole of the artistic world, and made it impossible for any other artist to achieve anything free from the charge that he owed the idea to one or the other. But although he learnt much from them, he still preserved more of his originality than his other contemporaries, and infused a spirit of refinement into his work which has never been surpassed. No architect, excepting, perhaps, Brunelleschi and Bramante, did more in the development of the application of Roman architecture to modern times.

In the discussion which followed Sir Henry Howarth, Professor Beresford Pite and Colonel Prendergast spoke.

The Widening of the Strand in connection with the new street is expected to be finished in May next, soon after which it is hoped that the crescent road will be formed.

The Bristol Association of Clerks of Works and Builders' Foremen held its annual dinner last Saturday evening, Mr. Peter Addie presiding. Mr. A. S. Scull gave the toast of "Architects, Engineers and Surveyors." Mr. Frank Wills (President of the Bristol Society of Architects) responded. Nothing could be more pleasing to the architects than to know that this association, formed in the interests of its members, the clerks of works and builders' foremen, was getting on so well. With regard to what was called limiting the output, he thought that it would be quite possible that the men should work shorter hours and do as much work as they did now; the early morning hours were often wasted. Mr. W. Kidwell proposed "The Bristol Master-Builders," and Mr. G. Wilkins (President of the Bristol Association of Master-Builders) replied. The Chairman submitted "The Bristol Association of Clerks of Works and Builders' Foremen." Mr. W. F. Read (President) replied, and said they were combined to safeguard their own interests. He suggested more confidence between the builder and his foremen.



Trade and Craft.

A Great Sanitary Catalogue.

The twentieth-century catalogue of sanitary specialities which has just been issued by Messrs. Twyford, Ltd., is one of the largest and most elaborate that we have yet seen. Some idea of its size may be gauged from the fact that its price is £1, which amount is refunded on the first ensuing transaction of £5. The catalogue is divided into two parts, one including water-closets and their accessories, lavatories, urinals and baths, and the other dealing with fireclay goods. A very admirable feature is the printing of sectional diagrams showing clearly and in detail the various water-closets and other apparatus printed in colours on the opposite pages. The advantages claimed for the "Twycliff" patent syphon w.c. are that sewer gas cannot issue from it, that the water-surface is extra large and the seal deep, that the action is practically noiseless, and that the construction is simple and trustworthy. The special features of the "Axis-Syphon" are a patent after-flush chamber, a deep seal, a detachable syphon bend which can be placed at any angle, reliability of action with 2 gals. or 3 gals. flush, and the joint between the basin and the syphon bend always under water. Another pattern, the "Oriental" combined pedestal w.c. basin, was originally designed for use in Oriental countries in conformity with the customs of the natives, but at the suggestion of an eminent medical authority the design has been modified and in the present form will be found of inestimable advantage to sufferers from hæmorrhoids. Other patterns include the "Nereus," the "Cardinal," the "Sirdar," the "Deluge," the "Axis," the "Orion," the "Planetas," &c. All these numerous varieties are each intended to suit certain particular requirements, and they are to be obtained either plain or ornamented. The section devoted to lavatories shows an immense number of varieties, from simple basins with ordinary taps to elaborately-finished articles provided with patent wastes and overflows; there are also shown many forms of folding and cabinet lavatories, as well as lavatory ranges (the quadruple marble lavatory range with four basins arranged together is very neat and pleasing); while more than sixty varieties of fountain hand basins are illustrated. Urinals and baths are dealt with in a similarly exhaustive manner, and a great many kinds of baths are shown in the fireclay section, safety fittings being provided for hospitals and asylums. Another novelty is the combined shower and foot bath and lavatory, which is intended for the use of miners, ironworkers and others similarly engaged. Altogether this catalogue is a most

comprehensive one, and it should be in the hands of all architects and builders. Messrs. Twyford's London showrooms are at 120, Southampton Row, their potteries being at Hanley.

Stable Fittings, Iron Staircases, &c.

The St. Pancras Ironwork Co., Ltd., of St. Pancras Road, London, N.W., have bound up in book form their four catalogues dealing respectively with stable fittings, cow-house and piggery fittings, iron staircases, roofs, &c., and basement lighting: to the design and manufacture of which so much care and attention have been given. As regards the stable fittings, a very great number of which are illustrated, these are fitted together and marked before leaving the works and they are also given one coat of metallic paint to protect them from rust during transit and fixing. The posts of the stall and loose-box divisions are formed with plinths at the paving line, thus improving their appearance and increasing their strength at a most important point, and the improvements in the mode of constructing these divisions (secured in the patents of 1876 and 1884) has reduced the cost of fixing by one-half, unskilled labour only being required. In fixing the divisions it is necessary to erect all the ironwork first, then to lay the paving, and afterwards put in the boarding. For years past the St. Pancras Ironworks Co. has paid special attention to the paving and drainage of stables and the paving brick secured by their tenth patent is a very excellent one. This brick is perfectly non-absorbent and when properly laid and grouted forms a thoroughly water-tight surface; moreover, it is extremely hard, though it does not polish in wear or become slippery, on account of its gritty nature. The colour is brown. This catalogue shows some interesting plans of stables and also includes some practical notes and suggestions. The catalogue of iron staircases similarly gives some practical notes, while the very large number of varieties illustrated should satisfy every requirement; the outside fire-escape staircase, of which so many have been fixed by this firm to some of the largest buildings both in London and the provinces, are especially satisfactory: a fact which has found such a large demand for the manufactures of the St. Pancras Ironworks Co., Ltd.

Some New Drawing Instruments.

Several new drawing instruments have been patented by Mr. James P. Maginnis, A.M.I.C.E., M.I.M.E., engineering draughtsman, of 9, Carteret Street, Westminster, S.W. One is a T-square attachment, consisting of two slotted plates, which enables the square to be set at an oblique angle to the drawing-board, thus facilitating the drawing of plans, for example, which

run crosswise. Another device is the "Dead Beat" sectioner for indicating on drawings and tracings the various materials used in construction, and the specimen before us of work done with this instrument is certainly good. Another of Mr. Maginnis's inventions is an adjustable saucer-stand which can be tilted to any desired extent; another a drawing-paper clip; another a pencil-beam compass; and, lastly, a universal sector: particulars and prices of all of which can be obtained on application.

Smoky Chimneys.

Of the two kinds of smoky chimneys—those that smoke outside and annoy the neighbours, and those that smoke inside and annoy the occupants—perhaps the latter are the more exasperating; but the disadvantages of many smoky chimneys outside is deplorably evident in cities, where the air is made heavy and the sky obscured by murky clouds of unconsumed coal dust. Very often the smoke nuisance can be cured by placing a good cowl on the top of the chimney, which will create a strong updraught and prevent downdraught. Several such cowls are made by Messrs. Ewart & Son, Ltd., of 346, 348 and 350, Euston Road, London, the most successful being the "Empress." The head of this cowl has a carefully-turned spindle which works in a steel centre, always thoroughly lubricated, and it is thus possible to obtain a high speed without noise and with the least possible friction. The fans are made of steel well tinned to prevent them rusting and enamelled over afterwards. The other parts are made of strong galvanized iron riveted together and enamelled black. The fans are so arranged that they keep themselves clean of soot as they revolve and there is no obstruction to the sweep's broom, which can be pushed up to the top but cannot injure the oil cup or spindle, nor strike the revolving parts. The price of this "Empress" cowl varies from 25s. for small gas stoves to £3 5s. for large kitchen chimneys. Messrs. Ewart also make the "Prince" chimney pot for preventing downdraught, the "King" to quicken and regulate updraught, the "Vacuum" chimney pot, the "Exhaust" chimney pot, various wind guards, a large variety of revolving cowls on short bases for brickwork or to slip into existing chimney pots, and also the "Victoria" outlet ventilator, which last has been tested with highly satisfactory results.

New Classrooms, Bradfield College.—In this design by Mr. Mervyn Macartney an attempt was made to give an appearance of age to the brickwork in order to bring it into consonance with the older buildings; but the excessive neatness of the British workman doomed the attempt to failure.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BATH.—For the erection of school buildings, Oak Street, for the School Board. Mr. W. J. Wilcox, architect. 1 Belmont, Bath.—
C. Wibley ... £2,236 Hayward & Wooster ... £2,910
Erwood & Morris ... 7,041 Long & Sons ... 6,148
Chancellor & Sons ... 7,019 Wills & Sons ... 6,687
W. Webb ... 6,030 * Accepted. [All of Bath.]

CLACTON-ON-SEA.—For the erection of Baptist Church classrooms, &c., in Pier Avenue, Clacton-on-Sea. Mr. T. A. Cressy, architect and surveyor, Clacton-on-Sea.—
Ellis & Turner ... £950 0
W. S. Moore ... 945 0
Pennick & Taylor ... 940 0
Bray & Toynne ... 875 0
H. Smith ... 840 13
J. McKay ... 848 0
* Accepted. [All of Clacton-on-Sea.]

BUSBY (LANARKSHIRE).—For providing and laying about 1,000 yards of outfall sewer, and relative works, and for constructing sewage-purification works for the village of Busby, for the District Committee of the Middle Ward of the county of Lanark. Mr. W. L. Douglass, C.E., district engineer, 3, Clydesdale Street, Hamilton.—
A. Robertson, East Kilbride ... £4,125 13 8
W. McKerracher & Son, Busby ... 3,410 13 7
Shanks & McEwan, 160 St. Vincent Street, Glasgow ... 3,396 0 11
T. Christie, 9 Rosebery Place, Stirling ... 3,350 0 0
A. Duncan, 10 Waverley Gardens, Cross-myleof Glasgow ... 3,311 15 8
W. C. Harvey & Co., 141 Cathcart Street, Kingston, Glasgow ... 3,192 1 5
R. C. McBurner & Co., 44 St. Andrew Square, Edinburgh ... 3,175 2 3
Henderson & Duncan, Harmony Villa, Morningside, Edinburgh ... 3,144 12 5
Stirling & Kinniburgh, 3 Treaspar Avenue, Barrhead ... 3,124 9 4
D. & J. Stratton, 31 Stranville Place, Edinburgh ... 2,901 4 11
Brown Bros., 1 Millar Place, Morningside, Edinburgh ... 3,001 11 1
Crack & Luckwell, 134 St. Vincent Street, Glasgow ... 2,630 0 3
J. Pollock, 28 Bath Street, Glasgow ... 2,738 6 10
J. Johnstone, Bellshill ... 2,500 16 1
* Accepted.

CAMBRIDGE.—For the erection of Cambridge and County Boys' School. Messrs. A. Paul MacAlister and Edwin J. Tench, A.R.I.B.A., architects, 20, St. Andrew's Street, Cambridge; London and Norwich.—
With Terra Cotta Dressings. Dressings.
J. Shillitoe & Son, Bury St. Edmunds ... £8,200 ... £8,130
S. Foster, Bedford ... 7,750 ... 7,723
J. P. White, Bedford ... 7,777 ... 7,654
A. J. Bateman, Ramsey ... 7,070 ... 7,573
W. Sindall ... 7,642 ... 7,550
W. Saint ... 7,624 ... 7,498
W. Bell & Sons ... 7,324 ... 7,397
The Oak Building Co. ... 7,221 ... 7,218
E. Willmott & Son ... 7,102 ... 7,059
Gimson & Co., Royston ... 7,099 ... 7,044
H. J. Linzell, Newmarket ... 6,846 ... 6,598
Kerridge & Shaw ... 6,502 ... 6,224
Conlon & Lott ... 6,270 ... 6,520
* Accepted. [Rest of Cambridge.]

DUNFERMLINE.—For the construction of bacteria beds and relative works at Crosscraigs, for the Dunfermline District Committee of the Fife County Council. Mr. David Mackenzie, C.E., master of works, County Buildings, Dunfermline.—
Moir Bros., 50 Creighton Place, Leith Walk, Edinburgh ... £2,125 14 11
W. B. Street, Cowdenbeath ... 1,779 10 0
Street Bros., Ltd., Townhill, Dunfermline ... 1,004 9 9
J. Martin, Dunfermline ... 1,421 14 0
G. Dick, Dunfermline ... 1,415 13 5
Brown Bros., 1 Millar Place, Edinburgh ... 1,323 13 2
J. Miller & Sons, Cowdenbeath ... 1,279 5 2
Bald & Templeman, Cairn Hill, near Dunfermline ... 1,244 5 2
Adams's Patent Sewage Co., Ltd., York, patent automatic bacteria bed apparatus ... 204 10 0
Consideration of tenders referred to the Public Health Committee.

HULL.—For the erection of new central police station, for the Corporation.—
G. Loudon & Sons ... £23,770 0 0
F. Sweeting ... 22,953 0 0
F. Southern ... 22,402 13 2
F. Blackburn & Son ... 22,009 0 0
E. Good & Son ... 21,150 0 0
T. Goates ... 20,971 0 0
M. Harper ... 20,852 0 0
J. T. Levitt ... 20,769 0 0
Bowman & Son ... 20,769 0 0
* Accepted.

HOLLINGWORTH LAKE (LANCS.).—For the rebuilding of the Beach Hotel, Hollingworth Lake. Messrs. Openshaw & Gill, architects, Bury and Heywood. Quantities by Mr. Wm. E. Gill.—
J. & J. Coates, Rochdale ... £2,080
D. Diggle, Heywood ... 2,050
Blakeley & Wild, Heywood ... 1,980
W. Henderson, Littleborough ... 1,900
J. Twelves, Heywood ... 1,870
J. Poole, Littleborough ... 1,855
Thompson & Brierley, Bury ... 1,813
Enderby & Mutch, Rochdale ... 1,790
W. Crier, New Heap ... 1,784
J. Berry, Heywood ... 1,745
W. A. Peters & Sons, Rochdale ... 1,725
* Accepted.

LONDON.—For the erection of new schools at "Earlsfields," for the London School Board. Mr. T. J. Bailey, architect.—
W. M. Dabbs ... £20,165 J. Simpson & Son ... £25,740
W. Downs ... 28,418 Martin, Wells & Co. ... 25,882
J. & M. Patrick ... 27,745 Holliday & Greenwood, Ltd. ... 25,160
E. Lawrence & Sons ... 27,255 Ltd. ... 25,160
Holloway Bros. ... 28,440 Hampton & Co. ... 26,110
Kirk & Randall ... 26,412 Leslie & Co., Ltd. ... 24,097
J. Garrett & Son ... 26,161 Lathley Bros. ... 24,019
W. H. Lorden & Son ... 25,888 F. & H. P. Higgs ... 24,780
Treasure & Son ... 26,772 W. Johnson & Co., Ltd. ... 23,790
* Recommended for acceptance.

LLWYNPIA (WALES).—For the erection and completion of 12 houses at Tuberville Road, Llwynpia, Rhondda Valley, for the Pontrhyda Building Club.—
T. Reynolds, Heolbach, Ystrad ... £2,820
D. P. George, 85 Tyntyla Road, Llwynpia ... 2,580
S. Rees & Co., Tyntylawith, Tylstown ... 2,475
* Accepted.

LONDON.—For the erection of a domestic economy centre at Plasy Road School, for the London School Board. Mr. T. J. Bailey, architect.—
G. E. Wallis & Sons ... £2,980 J. & C. Bowyer ... £2,440
W. Johnson & Co., Ltd. ... 2,716 P. Bullock & Co. ... 2,408
F. & H. F. Higgs ... 2,908 J. Smith & Sons, Ltd. ... 2,360
Kirk & Randall ... 2,586 T. J. Long ... 2,357
J. Garrett & Son ... 2,557 J. Marsland & Sons ... 2,327
W. J. Mitchell & Son ... 2,557 J. Appleby ... 2,237
W. H. Lorden & Son ... 2,477 * Recommended for acceptance.

LONDON.—For providing new offices for all departments, with separate pans and traps, refitting lavatories, and providing new drainage scheme at Wordsworth Road School, for the London School Board. Mr. T. J. Bailey, architect.—

G. Bell ... £3,382 0 0
R. P. Beattie ... 3,919 11 10
McCormick & Sons ... 3,918 0 0
S. Munday & Sons ... 3,912 0 0
Durbin & Katesmark ... 3,790 17 0
Ashby & Horner ... 3,702 0 0
E. Lawrence & Sons ... 3,720 0 0
G. S. S. Williams & Son ... 3,653 0 0
F. Bull ... 3,390 0 0
Willmott & Son ... 3,370 0 0
L. H. & R. Roberts ... 3,302 0 0
* Recommended for acceptance.

LONDON.—For works at Clyde Street School, for the London School Board. Mr. T. J. Bailey, architect.—
Ashby & Horner ... £4,347 0 0
Martin, Wells & Co. ... 4,103 0 0
J. & C. Bowyer ... 3,675 0 0
Johnson & Co. ... 3,671 8 6
Sanitary Lead-Lining and Pipe-Bending Co., Ltd. ... 3,665 0 0
R. P. Beattie ... 3,501 16 10
G. Parker ... 3,495 0 0
J. W. Falkner & Sons ... 3,350 0 0
Durbin & Katesmark ... 3,327 2 3
J. T. Robey ... 3,223 11 0
W. Downs ... 3,189 0 0
* Recommended for acceptance.

LONDON.—For improvements at Princess Road School, for the London School Board. Mr. T. J. Bailey, architect.—
G. Munday & Sons ... £2,386 0 0
Stimpson & Co. ... 2,360 0 0
C. Miskin & Sons ... 2,360 0 0
Treasure & Son ... 2,218 0 0
W. King & Son ... 2,066 0 0
L. H. & R. Roberts ... 2,630 0 0
Clark & Gray ... 2,013 0 0
General Builders, Ltd. ... 1,994 0 0
H. Wall & Co. ... 1,952 0 0
J. Simpson & Son ... 1,863 17 0
Staines & Son ... 1,960 0 0
F. Triggs ... 1,850 0 0
J. Appleby ... 1,811 0 0
* Recommended for acceptance.

LONDON, E.—For the carrying out of extensive sanitary works at the infirmary, for the Guardians of St. George-in-the-East.—
R. P. Beattie ... £4,300 Vigor & Co. ... £2,000
H. Wall & Co. ... 3,790 H. C. Horswill ... 2,890
M. Calnan & Sons ... 3,935 F. & T. Thorne ... 2,710
Strange & Sons ... 3,587 J. Gibbs, Cable Street ... 2,685
Hampton & Sons ... 3,520 Doullton & Co. ... 2,630
Durbin & Katesmark ... 3,603 W. Pearson ... 2,617
B. Finch & Co. ... 3,000 W. T. Cooper ... 2,578
B. E. Nightingale ... 2,900 A. E. Innes ... 2,530
* Accepted.

LONDON, S.W.—For finishing two partly-erected houses near Tulse Hill Station. Mr. Sadgrove, architect, 22 Surrey Street, Strand, W.C.—

J. Westbrook, Collier's Water Lane, Thornton Heath ... £2,450
C. Wheeler, 27 & 28 King William Street, W.C. ... 2,200
F. A. Moat, 40 Woodland Road, Upper Norwood ... 2,250
T. Truett & Steel, High Street, Thornton Heath ... 2,103
W. Read, 48 Church Road, Brixton, S.W. ... 2,130
F. & W. Pearce, Whitehall Road, Thornton Heath ... 2,000
A. Pauls, Ardene Road, Brixton Hill, S.W. ... 1,968
C. Watts, 120 Fawe Park Road, Putney, S.W. ... 1,700
G. Lawrence, 110 Ringstead Road, Catford, S.E. ... 1,725
* Accepted.

MARLBOROUGH.—For providing and laying about 25 yards of 12-in. cast-iron inlet sewer, and the construction of cast-iron storage tank, screening chamber, engine house, and all accessories; also for the construction of septic tanks in duplicate, eight bacterial filters, and laying-out the necessary land for filtration, together with all incidental works, for the Town Council. Messrs. Fairbairn & Sons, C.E., engineers, 13 Lendal, York.—
J. Coker, Halling, near Rochester ... £2,812 1 0
Playfair & Toole, Southampton ... 8,444 0 0
Johnson Bros., "The Harton," Hereford ... 7,074 14 6
A. Wills & Sons, Spring Gardens, Bath ... 6,720 0 0
T. Pedrate, 106 Forbury Road, Clifton, Bristol ... 5,130 0 0
J. Jackson, "The Laurels," Plaistow, E. ... 5,093 18 0
H. Tyson, Halifax ... 5,033 17 10
Grisham & Newton, Whitehall Chambers, Carlisle ... 5,943 2 0
G. Bell, Tottenham, London ... 5,513 0 0
* Accepted.

MARPLE.—For the erection of new National Schools at Marple. Messrs. James Hunt & Sons, architects, 4 Warren Street, Stockport.—
R. Neill & Sons, Manchester ... £2,500 0 0
H. Partington & Son, Manchester ... 2,500 0 0
J. T. Port, Marple ... 2,343 0 0
W. C. Broadhurst & Co. Stockport ... 2,290 0 0
J. Broadhurst, Stockport ... 2,290 0 0
J. Briggs, Stockport ... 2,229 0 0
D. Eadie, Stockport ... 2,178 0 0
M. Lane, Stockport ... 2,150 0 0
S. Robinson & Sons, Ltd. ... 2,119 0 0
* Accepted.

MENSTON (YORKS.).—Accepted for the erection of a hospital. Messrs. Blackwell & Thomson, architects, Leicester.—
W. Fletcher & Sons, Yeading, bricklayers, masons, &c. ... £8,220
I. Taylor, Lees, near Keighley, carpenter and joiner ... 1,863
S. Atkinson, Wakefield, plumber and glazier ... 1,800
J. Smithies, Bradford, slater ... 575
A. Firth, Yeading, plasterer ... 350
Bilton, Menston, painter ... 253

MUNDESLEY (NORFOLK).—For the construction of about 14 miles of brick and stoneware pipe sewers, manholes, ventilating shafts, and other works in connection with the sewerage of Mundesley, for the Erpingham Rural District Council. Mr. T. Inglis Goldie, engineer, Bank Buildings, Bank Plain, Norwich.—
Rackham, Norwich ... £4,900 0 0
Blyth, Foulsham ... 4,406 0 0
Case Sea Defence Syndicate, London ... 4,114 8 7
J. & T. Binns, Croydon ... 4,060 14 0
Burgoyne & Son, Ipswich ... 4,004 5 2
B. Cooke & Co., London ... 4,060 0 0
Hipperson, Wymondham ... 3,955 0 0
Johnson & Langley, Leicester ... 3,936 18 8
Hill & Andrews, Nottingham ... 2,004 0 0
Bradshaw & Co., 54 Queen Victoria Street, London ... 3,947 0 0
* Accepted.

NORWICH.—For the erection, completion, and maintenance for six months of a new picture gallery at the Castle Museum, Norwich, for the Corporation. Mr. Arthur E. Collins, M.I.C.E., city engineer.—
H. E. Hawes ... £1,578 0 0
Chapman & Son ... 1,538 0 0
J. Downing ... 1,526 0 0
T. Gill ... 1,491 0 0
J. S. Smith ... 1,454 10 0
City engineer's and architect's estimate, £1,500.
* Recommended for acceptance. [All of Norwich.]

NORWOOD.—For works at Deerfield, Beulah Hill, Norwood, for Mr. M. J. Jonas. Mr. Percy L. Marks, architect, Albert Buildings, 40 Queen Victoria Street, E.C.—
J. & C. Bowyer ... £140 0 0
A. V. Paddison ... 130 10 0

Including for ventilation:
Boyle & Son ... 13 5 6
Waterproofing and decorating:
Szerelmey & Co. ... 25 0 0
And outbuildings (extras nett):
Paddison ... 17 8 11
House and message.

New drains included:
A. V. Paddison ... 1,088 12 0
F. & H. P. Higgs ... 857 0 0
J. & C. Bowyer ... 790 0 0

For modified requirements, but new drains and electric light installation included:
Dance, Bryant & Co. ... 536 0 0

Extras, including new carriage drive:
Dance, Bryant & Co. ... 210 0 0

Goods supplied (nett):
Emdeca Decoration Co. ... 7 10 5
A. Sanderson & Son ... 52 8 5
General Electrical Co. ... 64 5 0

Laying in cable from highway.
Callender Co. ... 14 15 4
Total expenditure (with sundries), nett, £1,064 17 8
* Accepted.

RAUNDS (NORTHANTS).—For the erection of club premises. Messrs. Brown & Fisher, architects, Wellingborough.—
T. H. Coleman ... £1,587
Siddons & Freeman ... 1,330
R. Marriott ... 1,300
Goodman & Murket ... 1,230
J. Lawrence ... 1,207
F. Hensell ... 1,248
Kettering Co-operative Builders ... 1,220
Hacksley Bros. ... 1,219
Smith & Son ... 1,198
W. H. Lovell, Raunds ... 1,124
* Accepted.

SIDCUP (KENT).—For additions, re drainage, and alterations to The Hollies House, to adapt same as the administrative block of the new children's homes, for the Greenwich Union Guardians. Messrs. T. Dinwiddie, F.R.I.B.A., F.S.I., and T. Norman Dinwiddie, A.R.I.B.A., architects. Quantities by Mr. Louis Jacob.—
J. E. Mills, Westcombe Park, S.E. ... £2,146
G. Jackson, Sutton, Surrey ... 5,066
H. L. Holloway, Deptford ... 4,894
T. D. Leng, Deptford ... 4,825
B. J. White, Chislehurst ... 4,977
Staines & Son, Great Eastern Street, E.C. ... 4,614
J. Lonsdale, Swanley ... 4,504
W. Mills, Westcombe Park ... 4,277
W. Nash, New Cross ... 4,087
T. Rowbotham, Birmingham ... 3,677
* Accepted.

TEIGNMOUTH.—For alterations at Wills and Dorset Bank. Messrs. Bridgman & Bridgman, A.R.I.B.A., M.S.A., architects, Torquay and Paignton. Quantities by Mr. Vincent Catemole Brown, Paignton.—
Fredk. C. Francis, Teignmouth ... £1,630
Hugh Mills, Newton Abbot, S.E. ... 1,500
* Accepted. [Architect's estimate, £1,550.]

New Companies.

Cambrian Slate Quarries, Ltd.

Registered to adopt an agreement with V. Groom, and to carry on the business of mine-owners, miners and smelters; as slate, slab and stone quarry owners, &c. Capital £15,000 in £1 shares. The directors are V. Groom, R. F. Miller and W. G. S. Hynde. Registered office: The Cook and Ddol Quarry, Llanberis, Carnarvonshire.

Chesterfield Estates Co., Ltd.

Registered to acquire, deal with, work and turn to account land, house and other property, deal in freehold and leasehold ground rents, to lay out land for building purposes, &c. Capital £10,000 in £50 shares. The directors are G. A. Eastwood, S. E. Short and F. A. Walker.

Cumberworth Brick and Tile Co., Ltd.

Registered to acquire as a going concern the business of brick and tile manufacturers as now carried on by S. S. Wood, H. Wood and J. E. Armitage at Cumberworth, Yorkshire, as the Cumberworth Brick and Tile Co., also as potters, manufacturers of and dealers in terra-cotta, draft pipes, pans, vessels, mouldings, &c. Capital £7,000 in £1 shares. The directors are S. S. Wood, J. E. Armitage, H. Wood, W. H. Hirst, P. Wood, B. Senior and F. Nicholson. Registered office: Cumberworth, near Huddersfield.

Eddystone-Aberthaw Lime and Cement Co., Ltd.

Registered to carry on business as manufacturers of and dealers in lime and cement, plaster, flags, and artificial stone and materials used in the manufacture thereof, &c. Capital £40,000 in £1 shares.

Hirst Brothers' Quarries, Ltd.

Registered to acquire the business of quarry owners and stone merchants as now carried on at Dunford Bridge, near Sheffield, Yorkshire, as Hirst Brothers, and, further, to carry on business as builders and contractors, brick and sanitary pipe makers, artificial stone makers, &c. Capital £2,000 in £1 shares. The directors are Allen, Abraham and B. Hirst. Registered office: Dunford Bridge, Sheffield, Yorkshire.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
Feb. 20	Dunholme—Organ-chamber at Church	Urban District Council	Vicarage, Dunholme.
20	Merthyr—Reading-room	Urban District Council	Surveyor, Town Hall, Merthyr.
20	Merthyr—Rebuilding Inns	Urban District Council	C. M. Davies, 112 High Street, Merthyr.
20	Winstead, Hants—Alterations, &c., to Hotel	Mew, Langton & Co., Ltd.	Lemon & Blizard, Architects, Lansdowne House, Castle Lane, Southampton.
20	Radstock, Somerset—Reconstructing Retaining Walls	Urban District Council	G. H. Gibson, Surveyor, Radstock, Bath.
20	Seascale, Cumberland—Dwelling House	Miss Hodgson	C. Bord, 33 Queen Street, Whitehaven.
20	Carlisle—Temporary Wooden Bridge	Urban District Council	H. O. Marks, 36 Fisher Street, Carlisle.
20	Dromalane, Newry—24 Villa Residences	Urban District Council	W. J. Watson, Benvenue, Rostrevor.
20	Bradford—Mission Hall, &c.	Urban District Council	W. J. Morley & Son, 259 Swan Arcade, Bradford.
20	Cowbridge—Re-building Hotel	Urban District Council	E. J. Williams, 31 High Street, Cardiff.
21	Huddersfield—Shop Fronts, &c.	Urban District Council	Borough Engineer, 1 Peel Street, Huddersfield.
21	Croydon—Enlargement of Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, Storey's Gate, S.W.
21	Garnfach, Nantyglo—School-room, alteration to Chapel, &c.	Primitive Methodist Connexion	Rev. S. Bryant, Worcester Street E., Brynmawr.
22	Willenhall—Rebuilding Bridge	Urban District Council	T. E. Fellows, Council's Engineer, Town Hall, Willenhall.
22	Ogmore Vale, Wales—School	Llangeinor School Board	T. J. Thomas, Architect, Bridgend.
22	Pontardawe, Wales—Chapel	Wesleyan Connexion	W. W. Williams, 63 Wind Street, Swansea.
22	Salisbury—Residence	R. Gerrish	F. Bath, Architect, Crown Chambers, Salisbury.
22	Dublin—Bank House, Shop and Offices	Northern Banking Co., Ltd.	W. H. Stephens & Son, 13 Donegall Square North, Belfast.
22	Holbeck, Leeds—Laundry, Wards, Lodge, &c.	Union Guardians	T. Winn & Son, 92 Albion Street, Leeds.
22	Halifax—Pair of Semi-detached Villas	Urban District Council	A. G. Dalzell, 15 Commercial Street, Halifax.
24	Durham—Offices	Weardale & Shildon Waterworks Co. Corporation	W. T. Jones, 7A North Bailey, Durham.
24	Birkenhead—Conveniences	Urban District Council	C. Brownridge, Borough Surveyor, Town Hall, Birkenhead.
24	Cardiff—Alterations, &c., to School	Urban District Council	James & Morgan, Architects, Charles Street Chambers, Cardiff.
24	Gateshead—Workshops	Urban District Council	L. H. Armour, 16 West Street, Gateshead.
24	Jarrow—Alterations, &c., to School	School Board	T. H. Spencer, Clerk, Board's Offices, Jarrow.
24	Birkenham—Bricks, Cement, &c.	Urban District Council	Surveyor, Council Office, Beckenham.
24	Sheffield—Bricks, Cement, Lime, &c.	Highway and Sewerage Committee	O. F. Wike, City Surveyor, Town Hall, Sheffield.
24	Brockley, S.E.—Refreshment House	London County Council	General Section, Architect's Department, County Hall, Spring Gdns.
24	Shoreditch—Four Blocks of Artizans' Dwellings	Borough Council	R. Plumble, 13 Fitzroy Square, W.
24	Belfast—New Premises	Wright & Hunter	A. Ferguson, Scottish Provident Buildings, Belfast.
24	Hinchliff Mill, Huddersfield—Additions, &c., to Chapel	Wesleyan Connexion	A. Charlesworth, Britannia House, Holmforth.
24	Tredegar, Mon.—Cemetery Buildings	Urban District Council	W. O. Widdowson, Surveyor, Bedwellty House, Tredegar.
24	London, S.W.—Portland Cement	London County Council	Manager, L.C.C. Works Department, Belvedere Rd., Lambeth, S.E.
25	Wooda Bay—Stabling	Starkey, Knight & Ford, &c.	Smyth-Richards & Fox, 3 Castle Street, Barnstaple.
25	Killarney—House	Urban District Council	T. T. O'Connor, 60 High Street, Killarney.
25	Walthamstow—Committee Room	Borough Council	G. W. Holmes, Council's Engineer, Town Hall, Walthamstow.
25	Devonport—Workmen's Dwellings	School Board	J. F. Burns, Borough Survr., Municipal Offices, Ker St., Devonport.
25	Portsmouth—Alterations, &c., to School	Commissioners of H.M. Works, &c.	A. H. Bone, Architect, Cambridge Junction, Portsmouth.
25	Esher—Post Office	Ulster Bank, Ltd.	Hunt & Steward, 45 Parliament Street, S.W.
25	Belfast—Office	Corporation	W. H. Stephens & Son, Donegall Square North, Belfast.
25	Birkenhead—Electric Tramway Car Shed	Watch Committee	O. Brownridge, Borough Surveyor, Town Hall, Birkenhead.
25	Derby—Three Cottages	Urban District Council	Mr. Ward, Borough Surveyor, Babington Lane, Derby.
26	Blaenannerch, Wales—Minister's House	Urban District Council	Chapel House, Blaenannerch.
26	Sowerby Bridge, Yorks—Offices, Smithy, &c.	Fulham Board of Guardians	W. O. Williams, 29 Southgate, Halifax.
26	London, S.W.—Chimney Shaft	Hackney Union Guardians	F. H. Medhurst, 13 Victoria Street, S.W.
26	London, N.E.—Casual Wards, Laundry, &c.	Corporation	P. R. Coles, Clerk, Hackney Union, Homerton, N.E.
26	Belfast—Technical Institute	Corporation	S. Etceveron, 83 Royal Avenue, Belfast.
26	Belper—Engine House, &c.	Rural District Council	J. Frith, Engineer, Baslow.
26	Tonbridge—Thatched Refreshment Kiosk & Bandstand	Urban District Council	W. L. Bradley, Council's Surveyor, Tonbridge Castle, Kent.
27	Maesteg—Additions, &c., to Infants' School	School Board	F. W. Burnett & Son, Architects, Tondu, near Bridgend.
27	Blaenllynfi, Maesteg—School, &c.	Maesteg School Board	E. W. Burnett & Son, Architects, Tondu, near Bridgend.
27	Canterbury—Underground Convenience	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, Canterbury.
27	Hastings—Walls, Fencing, &c., at Cemetery	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
27	Fandtach Beath—Wesleyan Chapel and School	Urban District Council	A. Price, Architect, Sandbach.
28	Hirst, Ashington—Memorial Drinking Fountain	Urban District Council	R. Marshall, Station Road, Hirst, Ashington.
28	Lurgan, Ireland—National School	Presbyterian Church Committee	H. Hobart, Architect, Dromora, Co. Down.
28	Helston—Police Station, &c.	Cornwall County Council	O. Caldwell, Architect, Victoria Square, Penzance.
March 1	Pandy, Wals—Improvements to Cottage	Urban District Council	E. Foster, Architect, Bella Vista, Abergavenny.
1	Bowes, near Darlington—Classroom	Grammar School Governors	Vicarage, Bowes.
ENGINEERING:			
Feb. 20	Liscard, Walsley, Cheshire—Feed-Water Heater, &c.	Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
21	Walsall—Tramways	Corporation	R. H. Middleton, Borough Surveyor, Walsall.
21	Bournemouth—Motor Generator	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
21	Glasgow—Switchboard Extensions	Corporation	J. Young, 48 Renfield Street, Glasgow.
21	Criccieth, Wales—Extending Sewer Outfall	Urban District Council	M. Williams, Surveyor, Criccieth.
21	King's Lynn—Boiler	Corporation	J. Pilling, Borough Electrical Engineer, King's Lynn.
21	Leamington—Sinking a Well	Urban District Council	W. de Normanville, Engineer, Town Hall, Leamington.
22	Leyland, Lancs—Borehole	Urban District Council	W. Wrennall, 9 Harrington Street, Liverpool.
22	East Ham—Electrical Plant	Rural District Council	W. O. Ullman, Electricity Works, Nelson Street, East Ham.
24	Bridgewater—Collecting Trenches, &c.	Town Council	T. M. Reed, Clerk, Bridgewater.
24	Bathgate, Scotland—Waterworks	Rural District Council	Shaw & Morton, 128 Wellington Street, Glasgow.
24	Settle—Water Supply	Corporation	T. A. Foxcroft, Town Hall, Settle.
25	Rochdale—Traction Switchboard, &c.	Tramways Committee	Lacey, Olirehugh & Sillar, 78 King Street, Manchester.
25	Birkenhead—Machinery for Repair Shop	Rural District Council	A. R. Fearney, Tramways Manager, Sessions House, Birkenhead.
26	Cannock—Water-supply Works	Fulham Union Guardians	W. E. Rogers, Engineer, Anson Street, Rugeley.
26	London, S.W.—Electric Plant	Corporation	F. H. Medhurst, 13 Victoria Street, S.W.
26	Derby—Boilers & Engineering Work at Public Paths	Metropolitan Asylums Board	J. Ward, Borough Surveyor, Babington Lane, Derby.
26	Tooting Gravney, S.W.—Repairing, Draining, &c., Subways	Islington Borough Council	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
26	London, N.—Tubular Well	Corporation	Borough Electrical Engineer, 50 Eden Grove, Holloway, N.
26	Manchester—Three Bridges over Canal	Bengal-Nagpur Railway Co., Ltd.	City Surveyor, Town Hall, Manchester.
27	London, E.C.—Machines, &c.	District Committee	Secretary, 132 Gresham House, Old Broad Street, E.C.
28	Loch Winnoch, Scotland—Bridge Works	Corporation	P. D. Alexander, Engineer, Dunmyat, Bridge-of-Weir.
28	Sunderland—Workshop Tools	Urban District Council	J. F. O. Snel, Borough Electrical Engineer, Town Hall, Sunderland.
28	Christiania—Swing Bridge	United Gaslight Co.	Ingenirvaabnets Kontor, Akershus Fastning, Christiania.
28	Linslade, Leighton Buzzard—Waterworks	Urban District Council	Sands & Walker, Engineers, Angel Row, Nottingham.
28	Sheffield—Boiler	Urban District Council	J. W. Morrison, Engineer, Company's Offices, Sheffield.
Mar. 1	Edinburgh—Electric Lighting Installation, &c.	Urban District Council	Resident Electrical Engineer, Electricity Supply Station, Dewar Place, Edinburgh.
IRON AND STEEL:			
Feb. 20	Lancaster—Steel Roofs	Electricity Committee	J. Cook, Borough Surveyor, Town Hall, Lancaster.
22	Manchester—Tramway Materials, &c.	Tramways Committee	J. M'Eroy, General Manager, 55 Piccadilly, Manchester.
22	Cerne, Dorset—Wrought-iron Staircase, &c.	Guardians	J. Peacey, South Walks, Dorchester.
22	Manchester—Stanchions, Girders and Roofs	Gas Committee	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
22	Glasgow—Steelwork	Caledonian Railway Company	Divisional Engineer, 3 Gernistown Street, Glasgow.
24	Tredegar, Mon.—Wrought-iron Fencing, &c.	Urban District Council	W. O. Widdowson, Surveyor, Bedwellty House, Tredegar.
24	Walthamstow—Iron Castings, &c.	Urban District Council	E. J. Gowen, Clerk, Town Hall, Walthamstow.
24	Sheffield—Stores	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
24	London, W.—Iron Goods, Lamp Columns, Gully Grates, &c.	Kensington Borough Council	Clerk, Town Hall, Kensington.
25	Wembley, Middlesex—Ventilating Columns, &c.	Urban District Council	O. R. W. Chapman, Surveyor, Public Offices, Wembley.
25	London, S.E.—Iron Fencing	London County Council	Parks Department, 11 Regent Street, S.W.
26	London, N.E.—Iron Fencing and Gates	London County Council	Parks Department, 11 Regent Street, S.W.
26	Leigh, Lancs—Gullies, Manhole Covers, &c.	London and North-Western Railway	T. Hunter, Borough Engineer, Bank Chambers, Leigh.
26	Linslade—O.I. Water Pipes, &c.	Urban District Council	Sands & Walker, Engineers, Angel Row, Nottingham.
26	London, N.E.—Sewer Ironwork	Hackney Borough Council	N. Scorgie, Borough Engineer, Town Hall, Hackney, N.E.
27	London, N.—Manhole Covers, Gully Grates, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
27	Rainhill, Lancs—Steam Fittings, Ironmongery, &c.	Newton-in-Makerfield U.D.C.	J. Gornall, Clerk, Rainhill Asylum, Lancs.
28	Earlestown, Lancs—Steam Tubes, Bolts, Gas Fittings	Urban District Council	Stores Clerk, Gasworks, Earlestown.
28	Linslade—Water Pipes, &c.	Urban District Council	Sands & Walker, Engineers, Angel Row, Nottingham.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY	WORK TO BE EXECUTED	FOR WHOM	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL—cont.:			
Mar. 1	Halifax—Wrought-iron and Steel, Pipes, &c.	Tramways and Electricity Committee	W. M. Rogerson, Borough Electrical Engineer, Foundry St., Halifax
" 1	Halifax—Stores	Highways and Tramways Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Southend-on-Sea—Manhole Covers, Lamp-columns &c.	Corporation	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Sheffield—Overhead Tramway Works	United Gas Light Co.	J. W. Morrison, Engineer, Offices, Commercial Street, Sheffield.
" 3	Wolverhampton—Stores	Corporation	Borough Engineer, Town Hall, Wolverhampton.
" 3	London, W.—Stores	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
" 3	London, N.W.—Smiths' Founders' Work, Ironmongery	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 3	Littlehampton—Cast-iron Pipes	Gas Co. Ltd.	Manager, Offices, Littlehampton.
" 5	Ashton-in-Makerfield—Stores and Materials	Urban District Council	J. W. Liversedge, Surveyor Council Offices, Ashton-in-Makerfield.
" 10	Batley, Yorks—Ironmongery	Town Council	O. J. Kirby, Borough Surveyor, Market Place, Batley.
" 12	London, N.—Stores, &c.	Hornsey Urban District Council	E. J. Lovegrove, Engineer, Southwood Lane, Highgate, N.
April 14	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
PAINTING AND PLUMBING:			
Feb. 27	Rainhill, Lancs—Plumbing, Lead, Paints, &c.	Newton-in-Makerfield U.D.C.	J. Gornall, Clerk, Rainhill Asylum, Lancs.
" 28	Earlestown—Lead, Lead Piping, &c.	Corporation	Stores Clerk, Gasworks, Earlestown.
Mar. 3	Wolverhampton—Paints, &c.	St. Pancras Borough Council	Borough Engineer, Town Hall, Wolverhampton.
" 3	London, N.W.—Paints, Oils, &c.		W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
ROADS AND CARTAGE:			
Feb. 20	Horncastle, Lancs—Materials	Rural District Council	J. E. Chatterton, Clerk, Council Offices, Horncastle.
" 20	Bebington, Cheshire—Materials	Urban District Council	Surveyor, Bebington.
" 21	Hardingstone, Northants—Stone, Granite and Slag, &c.	Rural District Council	J. Haviland, 2 St. Giles's Square, Northampton.
" 22	Ayr—Whinstone		A. Stevenson, 14 Cathcart Street, Ayr.
" 22	Lewes—Materials and Cartage	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
" 22	Belper—Material	Rural District Council	R. C. Gordon, Surveyor, Duffield, near Derby.
" 22	Pontypridd—Laying-out Recreation Ground	Corporation	A. O. Evans, Architect, Pontypridd.
" 22	Dewsbury—Paving, Flagging, &c.	Rural District Council	Borough Engineer, Town Hall, Dewsbury.
" 22	Sibsey, Lincs—Granite		J. W. Simpson, Clerk, Boston.
" 23	Horden Colliery—Streets, &c.	East Sussex County Council	Shotton Colliery Office, Shotton Bridge Station.
" 23	Lewes—General Team Labour	Highway and Sewerage Committee	F. J. Wood, County Surveyor, County Hall, Lewes.
" 24	Sheffield—Stores, Materials, &c.	Urban District Council	O. F. Wike, City Surveyor, Town Hall, Sheffield.
" 24	Beckenham—Team Labour, Materials, &c.	Rural District Council	Surveyor, Council Offices, Beckenham.
" 24	Guildford—Making-up	Rural District Council	J. Anstee, Surveyor, Commercial Road, Guildford.
" 24	Newark—Material	Urban District Council	R. Oakden, jun., Kirkgate, Newark.
" 24	Newcastle Emlyn, Wales—Paving, Draining, &c.	Urban District Council	T. Thomas, Surveyor, Terra Cotta Buildings, Newcastle Emlyn.
" 24	Fenarth—Road Metalling	Urban District Council	E. J. Evans, Surveyor, 9 Quay Street, Cardiff.
" 24	Rawtenstall, Lancs—Materials, &c.	Corporation	Borough Surveyor, Municipal Offices, Rawtenstall.
" 24	Walthamstow—Stones, &c.	Urban District Council	Surveyor, Town Hall, Walthamstow.
" 25	Southall, Middlesex—Materials, Team Labour	Urban District Council	R. Brown, Surveyor, Public Offices, Southall, Middlesex.
" 25	London, W.—Materials, &c.	Kensington Borough Council	Surveyor, Town Hall, Kensington.
" 25	Stanley, Durham—Street Works	Urban District Council	J. Routledge, Surveyor, Council Offices, Stanley.
" 25	Southampton—Flints	Corporation	Borough Engineer, Municipal Offices, Southampton.
" 25	Diss, Norfolk—Granite	Urban District Council	A. Cooper, Surveyor, The Retreat, Diss.
" 25	Dover—Materials	Town Council	W. Knecker, Town Clerk, Castle Hill House, Dover.
" 25	Droghda, Lancs—Setts	Urban District Council	C. Hall, Engineer, Council Offices, Droghda.
" 25	Southampton—Gravel	Corporation	Borough Engineer, Municipal Offices, Southampton.
" 26	Erdington, near Birmingham—Road Works	Urban District Council	H. H. Humphries, Engineer, Public Hall, Erdington.
" 26	Litherland, Lancs—Kerbing, &c.	Urban District Council	A. H. Carter, Surveyor, Sefton Road, Litherland.
" 26	London, N.—Materials, &c.	Wood Green Urban District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green, N.
" 26	Leigh, Lancs—Materials	Corporation	T. Hunter, Borough Engineer, Bank Chambers, Leigh, Lancs.
" 27	London, N.—Cartage, Materials, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
" 27	Hampton Wick—Cartage	Urban District Council	H. Fawcett, Clerk, High Street, Hampton Wick.
" 28	Tadcaster—Materials	Rural District Council	T. Scott, Surveyor, Aberford, near Leeds.
Mar. 1	York—Stores, &c.	Corporation	A. Creer, City Engineer, Guildhall, York.
" 1	Southend-on-Sea—Materials, &c.	Corporation	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Halifax—Stores and Materials	Highways and Tramways Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Halifax—Materials and Stores	Tramways and Electricity Committee	F. Spencer, Tramways Manager, Southern Depot, Halifax.
" 1	Worcester—Material	Highways and Bridges Committee	J. H. Garrett, County Road Surveyor, Shire Hall, Worcester.
" 3	London, W.—Gravel, &c.	Paddington Borough Council	Surveyor, Town Hall, Harrow Road, W.
" 3	Tredgar, Mon—Limestone Chippings	Bedwelly School Board	C. Dauncey, Clerk, Tredgar.
" 3	London, W.—Asphalt Paving, Materials, &c.	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
" 3	Wolverhampton—Stores, Materials, &c.	Corporation	Borough Engineer, Town Hall, Wolverhampton.
" 3	London, N.W.—Cartage, Materials, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 4	Hampton, Middlesex—Materials, &c.	Urban District Council	S. H. Chambers, Surveyor, Council Offices, Hampton, Middlesex.
" 4	London, S.W.—Materials	Middlesex County Council	H. T. Wakelam, Surveyor, Middlesex Guildhall, Westminster, S.W.
" 4	London, S.W.—Cartage	Middlesex County Council	H. T. Wakelam, Surveyor, Middlesex Guildhall, Westminster, S.W.
" 5	South Shields—Materials	Corporation	S. E. Burgess, Borough Surveyor, Chapter Row, South Shields.
" 5	Ashton-in-Makerfield—Materials	Urban District Council	J. W. Liversedge, Engineer, Council Offices, Ashton-in-Makerfield.
" 5	Halesowen—Street-making	Rural District Council	W. Whitworth, Surveyor, Public Offices, Great Cornbow, Halesowen
SANITARY:			
Feb. 20	Aston Manor, Birmingham—Sewer	Urban District Council	Surveyor, Council House, Aston Manor.
" 20	Harbledown & St. Nicholas, Canterbury—Sewers, &c.	Bridge District Council	A. Bromley, Radnor Chambers, Folkestone.
" 23	New Tredgar, Mon—Sewerage Works	Bedwelly Urban District Council	J. H. Lewis, Surveyor, Blackwood, Mon.
" 24	Walthamstow—Stores, &c.	Urban District Council	Surveyor, Town Hall, Walthamstow.
" 24	Keighley—Sewers, &c.	Rural District Council	H. M. Butterfield, 3 Lythorpe Terrace, East Morton.
" 24	London, N.—Sewer, &c.	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
" 24	Sheffield—Lime, Pipes, Traps, &c.	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 25	Minworth & Cudworth, Birmingham—Sewerage Works	Castle Bromwich Rural District Council	Wilcox & Raikes, Union Chambers, 63 Temple Row, Birmingham.
" 25	Northwich—Removal of Refuse	Urban District Council	J. A. Cowley, Clerk, Council Offices, Northwich.
" 25	London, W.—Sewer Work, Drain Pipes, &c.	Kensington Borough Council	Surveyor, Town Hall, Kensington.
" 25	Southall, Middlesex—Alumina, Disinfectants, &c.	Urban District Council	R. Brown, Surveyor, Public Offices, Southall, Middlesex.
" 26	Leigh, Lancs—Materials	Corporation	T. Hunter, Borough Surveyor, Bank Chambers, Leigh, Lancs.
" 26	Audenshaw, Lancs—Sewerage Works	Urban District Council	J. P. Wilkinson, 47 Arcade Chambers, St. Mary's Gate, Manchester.
" 27	Oldbury—Sewer Reconstruction	Urban District Council	J. T. Bayrs, 39 Corporation Street, Birmingham.
" 27	Ugborough, Devon—Drains, &c.	School Board	A. Warren, Architect, Buckfastleigh.
" 27	London, N.—Sewers, Disinfectants, Drain Testers, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
" 28	Earlestown, Lancs—Disinfectants, &c.	Newton-in-Makerfield U.D.C.	Stores Clerk, Gasworks, Earlestown.
Mar. 1	Southend-on-Sea—Stoneware Pipes, Disinfectants, &c.	Corporation	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Halifax—Pipes, &c.	Highways and Tramways Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Merton, near Croydon—Scavenging	Croydon Rural District Council	J. Wilson, Clerk, Town Hall, Fell Road, Croydon.
" 1	Tadcaster—Sewering, &c.	Rural District Council	Martin & Feawick, 1 Park Place, Leeds.
" 3	London, W.—Scavenging, Disinfectants, &c.	Paddington Borough Council	Surveyor, Town Hall, Harrow Road, W.
" 3	Sicgth, Bucks—Sewerage Works	Urban District Council	W. W. Cooper, Engineer, Mackenzie Street, Slough.
" 3	Wolverhampton—Lime, &c.	Corporation	Borough Engineer, Town Hall, Wolverhampton.
" 3	London, N.W.—Scavenging, Pipes, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 5	Ashton-in-Makerfield—Materials and Stores	Urban District Council	J. W. Liversedge, Engineer, Council Offices, Ashton-in-Makerfield.
" 6	Colchester—Pipes, Lime, &c.	Reads and Drainage Committee	H. Goodey, Borough Surveyor, Colchester.
" 10	Batley, Yorks—Sanitary Tubes, &c.	Town Council	O. J. Kirby, Borough Surveyor, Market Place, Batley.
" 12	London, N.—Disinfectants, &c.	Hornsey Urban District Council	E. J. Lovegrove, Council's Engineer, Southwood Lane, Highgate, N.
" 24	Tewkesbury—Sewers, &c.	Rural District Council	H. A. Badham, Clerk, Tewkesbury.
TIMBER:			
Feb. 24	Sheffield—Timber, &c.	Highway and Sewerage Committee	O. F. Wike, City Surveyor, Town Hall, Sheffield.
" 24	London—Oak Fencing	London County Council	Parks Department, 11 Regent Street, W.
" 25	Leeds—Timber	Gas Committee	R. H. Townsley, General Manager, Municipal Buildings, Leeds.
" 25	London, W.—Timber, &c.	Kingston Borough Council	Surveyor, Town Hall, Kensington.
" 17	London, N.—Timber, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
Mar. 1	Southend-on-Sea—Timber (Spruce, Pine, &c.)	Corporation	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Halifax—Timber	Highways and Tramways Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Halifax—Timber	Tramways and Electricity Committee	W. M. Rogerson, Borough Electrical Engineer, Foundry St., Halifax.
" 3	London, N.W.—Timber and Joinery Materials, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Feb. 26	Kanturk, Ireland—Water-Supply Scheme	£20.	T. Guiney, Clerk, &c., Rural District Council, Workhouse, Kanturk.
Mar. 1	Aldershot—Laying-out Pleasure Ground	£20, £10, £5.	N. F. Dennis, Surveyor, Urban District Council, Offices Aldershot.
" 5	New Malden, Surrey—Public Offices, Fire Station, Mortuary, &c.	£25, £10.	C. T. Lewis, Clerk, Malden and Oombe Urban District Council, 7 Market Place, New Malden.
" 14	Dunstable—Infectious Diseases Hospital	£5 5s.	C. C. S. Benning, Town Clerk, Dunstable.
" 15	London, S.W.—Military Ambulance Wagons	£500, £250.	Director-General of Ordnance (O 7), War Office, Pall Mall, S.W.
" 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Edge, Sheffield.
" 29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Nava River	£25, £10.	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Wakefield—Improvement of Interior of Exchange Buildings	—	J. J. Martin, Bull Hotel, Wakefield.

COMING EVENTS.

Wednesday, February 19.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Meeting).—Mr. Robert F. Shearer on 'Architectural Perspective.'

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley on 'Duties of a Sanitary Inspector: Outdoor,' 7 p.m.

RUSKIN SOCIETY OF BIRMINGHAM.—Mr. T. O. Gotch on 'Robert Louis Stevenson from a Painter's Point of View,' 7.45 p.m.

CHEMICAL SOCIETY.—Meeting at 5.30 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.

BRITISH ARCHEOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the works of Messrs. John J. Thornycroft & Co., Ltd., Church Wharf, Chiswick, W., 2 p.m.

Thursday, February 20.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Sir Wyke Bayliss, F.R.B.A., on 'Shakespeare, in relation to the evolution of Landscape Art.'

SOCIETY OF ARCHITECTS.—Mr. Herbert W. Bacon on 'Stained Glass,' 8 p.m.

ROYAL ACADEMY.—Mr. Alfred Gilbert, R.A., on 'Sculpture'—II. 4 p.m.

LONDON INSTITUTION.—Mr. L. R. W. Forrest on 'The Second City of the Empire,' 6 p.m.

CARPENTERS' COMPANY, Carpenters' Hall, E.C.—Prof. J. A. Fleming, D.Sc., F.R.S., on 'The Transmission of Light and Electricity,' 8 p.m.

Friday, February 21.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. F. C. Eden on 'The Organ: Its Proper Position and Architectural Treatment,' 7.30 p.m.

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COMING EVENTS—cont.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. Thomas S. Fraser on "The Renaissance of Scotland," 8 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Annual General Meeting at 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley on "Duties of a Sanitary Inspector: Indoor," 7 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Paper by Mr. Edgar Wood, A.R.I.B.A.

ROYAL INSTITUTION.—Mr. W. Duddell on "Musical and Talking Electric Arcs," 9 p.m.

Saturday, February 22.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Mr. W. Carrick Anderson, M.A., D.Sc., on "The Structure of Cementing Materials," 7.30 p.m.

ROYAL INSTITUTION.—Lord Rayleigh on "Some Electrical Developments"—II., 3 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to the North British Railway Company's Hotel at Waverley.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and demonstration at Lambeth Disinfecting Station, Wanless Road, Loughborough Junction, at 3 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—New Baths and Washhouses of the Borough of Fulham, Welmoth Place, S.W., at 3 p.m.

Monday, February 24.

LONDON INSTITUTION.—Prof. William Ramsey, D.Sc., F.R.S., on "Inert Gases of the Atmosphere," 5 p.m.

ROYAL ACADEMY.—Mr. Alfred Gilbert, R.A., on "Sculpture"—III., 4 p.m.

SOCIETY OF ARTS.—Mr. Cyril Davenport, F.S.A., on "History of Personal Jewellery from Prehistoric Times"—III.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

Tuesday, February 25.

ROYAL INSTITUTION.—Mr. W. N. Shaw on "The Temperature of the Atmosphere"—I., 3 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, B.A., M.D., on "Duties of a Sanitary Inspector, 7 p.m.

SOCIETY FOR THE PROMOTION OF HELLENIC STUDIES.—Meeting at 5 p.m.

Wednesday, February 26.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. G. Burn-Murdoch on "Historical Design proposed for the New Municipal Buildings," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. A. Wellesley Harris, M.R.C.S., on "Infectious Diseases," 7 p.m.

Inspection and Demonstration at Soap Works.

NORTHERN ARCHITECTURAL ASSOCIATION.—Council Meeting at 6.45 p.m. Mr. Allan Greenwell, F.G.S., A.M.I.C.E., on "Bitumen: Its Application in Architecture and Engineering," 7.30 p.m.

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GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

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An Architectural Causerie.

THE memorial to the late Lord Leighton which was unveiled in St. Paul's Cathedral

last week is one of the finest of Mr. Brock's many fine works: its pedestal of Cippolino marble, with a black marble base, is treated in a satisfactory architectural manner and in admirable proportion to the bronze sarcophagus which bears the recumbent figure of our greatest classical painter: of which Sir Edward Poynter said in the course of the unveiling ceremony, "it presents to the world a record of the man in a portrait which I may venture to say has never been surpassed for vivid resemblance, for beauty of expression, and for tenderness of feeling." At either end beneath the sarcophagus are the figures of Painting and Sculpture. It is not without interest that this monument should be close to that splendid work by Alfred Stevens which was rescued from its obscurity in one of the chapels of the cathedral and placed in its present position through the energy and generosity of the dead artist now so fittingly commemorated.

Architects' Commissions.

A SHORT time ago the Bishop of Coventry said at a meeting of the Birmingham School Board, of which he is the chairman, that "when architects were paid partly or wholly by commission it could hardly be possible, human nature being what it was, that they should make economy their principal study, or even their serious study at all"; and later he said in a letter to Mr. William Henman, the well-known architect of Birmingham, who took up the cudgels on behalf of his profession, that "given on one side the ratepayers' purse, the desire to produce artistic results, and a percentage on the cost, and on the other side a conscientious and pious wish for economy, the strain upon 'human nature, being what it is,' is excessive." The point is an interesting one, and examples might be brought forward in support of both views of the case: but it is not just to saddle the general body of architects with the statement that they do not attempt to reduce the cost of buildings when their commission is proportionately augmented by it. In designing a Board school, for example, a respectable architect does not add features simply because they will increase the cost and his commission on it. If the Board is prepared to spend, say, £10,000 on the work, he endeavours to design a building which will cost that sum; he cannot—and is not to be expected to—do this exactly; and if the tenders exceed the amount, that is not necessarily the architect's fault. The cost may be

reduced if deal is supplemented for oak, if tile dados are dispensed with, or if door fittings of a less substantial character are used—a process of reduction often practised; but the school will be proportionately impoverished by these alterations: and if the architect considers that the better fittings should be used, because they will eventually prove the more economical, he is not to be blamed for including them in his original design. There have certainly been many cases where excessive expenditure has been wantonly passed by architects, who have made no attempt to lessen it, but an aspersion must not be cast on the whole architectural profession because some of its members are defaulters with an easy conscience.

A Sedding Church.

THE church of St. Clement, Bournemouth, built in 1873, is the best known and most interesting of the early works of John Sedding.

too, strayed from the fold Botticelli, stand as pinnacles on the corners of the aisle. The reredos at the back of the high altar is crowded with saints, while the panel below them is filled by a figure on horseback, representing Lieutenant Edwin Christie, to whose memory it was erected. The Life of St. Clement is figured on the font. His anchor is patterned on the floor throughout the church; large in the nave, and small in the chancel, and on the scutcheons suspended from the lamps. On the pulpit rails we also have his anchor and monogram cast in copper; and the balustrade is twisted into flowing wreaths of seaweed. Mr. Wilson, who completed the church, was associated with John Sedding in much of his later work. He is one of the chief leaders in the Arts and Crafts movement: an accomplished worker in metals: and considered by many to be one of the finest architects and craftsmen of to-day. Mr. Wilson has said: "The best work of John Sedding will, I think,



ST. CLEMENT'S CHURCH, BOSCOMBE, BOURNEMOUTH. DESIGNED BY THE LATE J. D. SEDDING AND COMPLETED BY H. WILSON.

It stands back from the road, an oasis in a desert of villas, and has a nave, north aisle, north porch, chancel, lady chapel, vestries and a western tower, the last completed since his death. The nave arcade has pointed arches, with capitals hinted at rather than expressed. Above the arches is a range of stone panels, homes prepared for an army of saints. The chancel and lady chapel are divided from the nave by stone screens. The design of that in front of the chancel is a daring and original combination of intersecting arches, surmounted by a row of angels holding candlesticks, while the cusps of the side openings bud out into tiny adoring angels folded up in bract-like wings. Angels,

never be fully known. It can only be appreciated in its effects. It was not what he did that should command our greatest admiration, but what he made others do. His claim on our regard does not rest, as some may think, on the invention of a new style, nor even upon the more or less successful modification of an old one, nor does it rest wholly or even mainly on the mass of work he left behind, beautiful as much of it is. It rests on his personal influence, on his inspiring enthusiasm, on the intellectual stimulus he provided. . . . Sedding's art is not scholarly, but his designs are full of himself, and those who knew his nature are the greatest admirers of his work."



A CASTLE ON THE RHINE: FROM A DRAWING BY VICTOR HUGO.

VICTOR HUGO AND GOTHIC ARCHITECTURE.

By F. H. CHEETHAM.

[NOTE.—The Victor Hugo Festival at Paris began yesterday and the monument on the Place Victor Hugo is to be unveiled to-day. The festival will be continued till March 2nd.]

VICTOR HUGO, the centenary of whose birth is just now being celebrated, although by no means the first to give the name of a building to a work of fiction, is perhaps the only writer who has succeeded in investing an architectural creation with all the glamour of a hero of romance, and making it in a very real sense the central point of a story. The human interest in "Notre Dame de Paris" is, indeed, immense, but the dark mass of the Gothic cathedral seems to overshadow everything in the romance and to colour and influence the lives and characters of the actors in it. Huysmans has given a wonderful picture of Chartres in "La Cathédrale," but that book cannot, strictly speaking, be ranked as fiction, lying in a category of literature so far removed from "Notre Dame de Paris" as to preclude any comparison with it. M. Huysmans is as superior to Hugo in scholarship and real knowledge of art and architecture as Hugo is to the living writer in the exuberance of his imagination and the grotesqueness of his fancy. Scholarship and learning are the last things to be looked for in Victor Hugo. It might, perhaps, be going too far to say that he was a very ignorant man, but his assumption of a knowledge which he did not possess throws his ignorance very often into strong relief. But he had an intuitive faculty of perception at times, which, joined with an overweening self-confidence, gave a tone of authority to his words from the influence of which it is difficult to escape. Turgeneff tells a story of Victor Hugo which is very characteristic. The Russian novelist once asked Hugo who was Galgacus, whom he had included in a list of orators in some poem. "I have not an idea," was the poet's reply, "but it is a fine name."

It is probable that Victor Hugo had no real knowledge of architecture, although he indulges in a long dissertation on the subject in a well-known chapter in "Notre Dame de Paris." This novel was published in 1831, when the stream of the romantic revival was at its full. The battle had been won on the stage the year before with "Hernani." Now the triumph was repeated in another sphere. Mediæval Paris was made to live again in the pages of "Notre Dame," and for the first time, perhaps, for many generations the city recognised the living beauty and merit of her cathedral church. There was a mediæval enthusiasm in the air, which might have given an outside observer the impression that France, as well as our own country, was on the threshold of a Gothic revival. We know now

that there was no Gothic revival in France, and that there is never likely to be one. But the statement should not be made without a qualification. It is true that France saw no revival of building in the Gothic style, but she did see a very remarkable revival in appreciation of the art of the Middle Ages, the art which the eighteenth century had branded as barbarous. And this appreciation has never been lost. France looked back without going back, and her appreciation of the past is now no less real because she lives her own life in her own way. Victor Hugo quotes Voltaire as saying that before the time of Louis XIV. Paris possessed only four fine pieces of architecture, the Dome of the Sorbonne, the Val de Grace, the Louvre and the Luxembourg. "This opinion," says Hugo, "only affords one evidence, among so many others, that a man may be a fine genius and yet understand nothing of an art which he has not studied." Yet Hugo himself falls into an error almost as great as that of Voltaire. So wrapped up is he in the Paris of the fifteenth century that he has only words of condemnation and sarcasm for all the developments that have taken place between that time and his own.

He was a true Goth. Not that he understood Gothic architecture in the way a student understands it. But in his own way he did understand it. It spoke a living language to him, he felt its influence, and he tried to convey its message to others. His imagination was as grotesque and fanciful as the work of the mediæval builders that he so much admired. It was the Gothic spirit, so to speak, that he breathed, more than any knowledge of the art of a past day, that made him able to put life into the stones of the old cathedral of Paris. In this Victor Hugo differs materially from Sir Walter Scott. Scott's novels are generally held to have been one of the factors that helped towards the Gothic revival in England. There can be little doubt but that they were so. They created in the minds of a vast reading public an interest in and sympathy for mediæval times and mediæval architecture. Yet it may fairly be questioned whether the Waverley novels have really a trace of what architects call "Gothic feeling" in them. Their atmosphere is rather antiquarian and archaeological than a breathing of the living past. Nowhere are you taken back and made to live what, after all, was not, we may suppose, the very lovely existence of the Middle Ages. Scott's Gothic on paper is perhaps too much like that of his later namesake in stone. Victor Hugo's is as grimy and fantastic as one of Mr. Pennell's drawings of the Devils on his own loved cathedral. And probably that is the truer picture.

A good many causes went to make a Gothic revival in France impossible, which it is not for us here to enquire into. More than a century of academical training had put French architecture well on to the road which it has travelled on ever since. The Renaissance spirit was too

deep down in the French nature to be affected by even the passions of the romantic revival. But in truth the romantic revival had really no quarrel with Renaissance art, but only with the hard Classic spirit that bound and confined everything by its rigid rules. The romantic movement was, in its broadest aspect, but a struggle for liberty in artistic expression, and in different countries the movement necessarily advanced along different lines. The liberation to be effected in France was entirely different from our English liberation. Here, as far as literature is concerned, the work was done quietly in the study, and passed unnoticed in the street. Our drama was free. But in France the theatre was bound by the unities, and so the stage bore the brunt of the battle. The French had the battle of the Classicists and Romantics in poetry and the drama, with the culminating triumph of "Hernani." We had a battle of Classicists and Gothicists culminating in the triumph of Barry and Pugin at Westminster. Does that, then, imply that our architecture was less free at the beginning of the nineteenth century than that of France? We might hesitate to say so at first, yet there is a sense in which it was. We had suffered, or enjoyed, a Classic revival in architecture such as the French had scarcely fallen under, saved as they had been by their innate Renaissance lightness of spirit.

Sir Walter Scott had an audience ready, so to speak, to receive the influence of his Gothicism. And as his Gothic was clean and lovely withal, it was a pleasant and good thing to receive. Victor Hugo spoke to an audience whose minds in no way responded to his Gothic enthusiasm, and what he had to offer was neither clean nor lovely, but grimy, dirty and full of horrors. True, "Notre Dame de Paris" took hold of people and held them spell-bound. But that was the spell of Hugo's genius, from which even those who dissent most wholly from what he says, and object to his manner of saying it, are powerless to escape. "I liked cathedrals very much on the faith of 'Notre Dame de Paris,'" said Théophile Gautier at a later date, "but the sight of the Parthenon cured me of the Gothic malady never very strong in me." And so it was, we may suppose, with the mass of Frenchmen. Victor Hugo, in his Gothic devotion, as in everything else, stood alone. Though at the outset of his career surrounded with disciples and followers, he finished his life having founded no school, complete in himself, leaving no followers.

Hugo's picture of Paris in the fifteenth century as seen from the towers of Notre Dame is justly famous. He loved the city of his imagination for its picturesqueness, but no less for its homogeneity. "The Gothic Paris," he says, "was complete but for a moment." It is that moment that he seizes upon and never ceases to regret. "Since then this great city has been daily sinking into deformity . . . the present Paris has no general physiognomy. It is a collection of specimens of several different ages, and the finest of all have disappeared. This capital is increasing in dwelling-houses only—and in what dwelling-houses! If it goes on as it is now doing, Paris will be renewed every fifty years. So, also, the historical meaning of its architecture is daily wearing away. Its great structures are becoming fewer and fewer, seeming to be swallowed up one after another by the flood of houses. Our fathers had a Paris of stone, our sons will have one of plaster."

These last words have been often quoted. They were written in 1830, and never have words of ill omen been more happily falsified. Hugo was singularly unfortunate in his prophecies and predictions whether in art or in politics. Yet at the time he was justified in his fear of a Paris of plaster. "The city of plaster," writes Philip Gilbert Hamerton, "might have filled the whole space within the fortifications to-day if the railways had not brought stone so easily from a distance, but by a happy coincidence the colossal building enterprises of Napoleon III. were not undertaken before the principal lines of railway had been constructed, and by their means, not stone only, but vast quantities of wood and other materials were brought readily to hand." Under the Second Empire a new, and to some extent a homogeneous, Paris arose, and there is a certain irony in the fact that the man most responsible for saving the city from the future of plaster and meanness that Hugo



MR. ALFRED GILBERT'S ADDRESSES ON SCULPTURE.

IN the first of the six addresses on sculpture (entitled "Endeavour") which he is to deliver at the Royal Academy Mr. Alfred Gilbert, R.A., spoke at some length on the career of the late Onslow Ford. In years to come his name would be more to them than that of a teacher—it would be a name of honour. Onslow Ford began his studentship at a time when sculptors were in despair. There was no school of sculpture in England except one founded on pseudo-classic traditions, the school of which Gibson was the great seer. Ford came in on the receding tide of this period, and he had every difficulty to face. Where to study? what to do? Everything was chaos. So he went to Antwerp where other great artists had been trained, but found nothing more than there was in England. And in this connection, remarked Mr. Gilbert, his hearers might take it from him that the Royal Academy Schools now were quite as much—or more—up-to-date than any Continental schools; so that it was a fallacy for the students to go abroad to study amid surroundings with which they were out of harmony.

But to return to Onslow Ford. He learnt the rudiments of his art at Antwerp, but Antwerp was a "one horseshay" school, where all the

teaching was built up on a blind tradition, following which the professors said, "We had to learn all this years ago, and so you must learn it too." Anyone who broke away from this tradition was a black sheep, and they could easily imagine how a nature like that of Onslow Ford rebelled. Then he tried Munich, a school that was then waking up, and here, apart from technical training, he came insensibly under the influence of a certain phase of poetic feeling peculiar to Germany and to the German race, a phase of feeling—if he might say it without offence—that was impossible to a people of mixed descent like the Belgians. Here, too, he felt the influence of Wagnmüller, a sculptor whose realistic portrait busts the students might not know, though they were surprising examples of the work of a surprising artist.

Referring to this sculptor's influence on Onslow Ford's work, Mr. Gilbert spoke of a visit he himself made to an exhibition in his student days, when he was seeking training where he could not find it. He came across some portrait busts by Onslow Ford which stood out pre-eminent from the rest of the work, and wondered whence this man, then a stranger to him, had obtained certain qualities. Two years later he made his acquaintance and found out.

Returning to his introductory remarks Mr. Gilbert said that in his student days he remembered a Greek motto on which later on he should base a discrimination between chance and willed

foresaw for her, was the very man to whom Hugo owed his exile, and upon whose head he poured forth all the most venomous rancour of his hatred.

The mediæval spirit in Victor Hugo is perhaps nowhere more happily illustrated than in the imaginative picturings of the volumes called "Le Rhin." There, in the realm of legend and fairy tale, Hugo's imagination may have full play without our wishing to offer a remonstrance. His fancy goes out not only in words but in a vigorous and astonishing manner with his pencil. He was no mean draughtsman, but many of his creations are such as might well be calculated to keep a naughty child quiet. What Amiel said of his word pictures might very well be spoken of some of these sketches: "Victor Hugo draws in sulphuric acid, he lights his pictures with electric lights. He blinds, deafens, and bewilders. Strength carried to such a point as this is fascination." These sketches show an innate grotesqueness of imagination, something which could in no wise be the result of a mere accidental knowledge of a past art. But what knowledge and appreciation of Gothic architecture Victor Hugo possessed may perhaps be said to have had something accidental in it. The artist, he argued, should not strive to be greater than the Creator himself, whose world is not uniformly beautiful. Everywhere hideousness goes side by side with beauty, evil is mingled with good, and he conceived it to be a law of the highest art that the beautiful itself would be made more beautiful by the near presence of what is ugly. The art of the Middle Ages offered him this contrast, and Notre Dame with its juxtaposition of the sublime and the grotesque was a summing up in stone of his whole theory and conception of the romantic revival. Did the cathedral first unconsciously put the idea into Victor Hugo's head, or did he merely find in it the expression of his own fancy? That it had no such influence on other great minds of the time travelling along the same road may in itself not answer the question, but, looking back, as we are now able to do, over the completed life and work of Victor Hugo, we may safely say that the grotesque was as much part and parcel of Hugo's real self as was his magnificent genius or his amazing self-assurance.

The Foundations of a Roman Villa in Greenwich Park were found last week. The space opened has an area of about 16ft. The loose materials found so far include some tiles, pieces of mortar, and fragments of wall plaster of four different colours.

Mr. Edwin O. Sachs has, with a view of obtaining some relief on the executive side of his practice, made arrangements by which he will enjoy the co-operation of Mr. G. Spencer Hoffman, M.A., eldest son of Dr. H. W. Hoffman, late of the Home Office, and of Coombe Lodge, Putney. Mr. Hoffman, who was a pupil of the late Sir Arthur Blomfield, A.R.A., will practise with Mr. Sachs as his junior partner, and their mutual work will be carried on in the names of Edwin O. Sachs & Hoffman.



composition. Freely translated it ran thus: "Always strive after the best," but the motto in its Greek form would be the text of his lectures. The lecturer wrote it on the black-board in Greek characters, and said that he wanted to show them in future addresses that the Greeks were artists no less in their writing than in their sculpture.

Mr. Gilbert said in conclusion he wished to impress on the sculptor students a sense of the difficulty of the task before them. The honours were few, the failures many. It was a narrow ladder they had to climb, and it might happen that when they had reached the topmost round they might fall to the bottom and have to begin the climb all over again, full of disappointment and heartburn and gloom.

"To Accomplish" was the theme of Mr. Gilbert's second address on Thursday last. It was, he said, the outcome of industry, perseverance and self-control. Study was the ABC of their art, by which they learnt to attempt to accomplish, but he took it they would not be there at all unless an intellectual birthright gave them a calling towards the sculptor's art. To aid his precepts, he made a diagram of a tree, whose roots were romance and poetry; the greatest girth of its stem represented intellectual accomplishment, which merged into idealism. Above this was a label that stood for schools, on either side of which were boughs weighted with realism and mannerism; branching above this were individuality and self-control united by a seed-vessel called style, and this bore the opening bud of achievement, which, when more fully expanded, became creation. Realism and mannerism would give mere mountebank results, and true sculpture was essentially an expression of individuality. Mannerism, or fashion, was a great stumbling block, for it was natural to be struck with what at exhibitions won public applause and to copy it without remembering that they had neither the art nor the heart of the original artist.

Mr. Gilbert had noted the expert manipulation, the nimbleness of finger, in the schools, but as he was speaking as a guide rather than as a teacher he felt bound to say he did not see similar attention given to subject and design. Blake, he said, was in essence more of a sculptor than any man had ever been, except Flaxman, for the great mind was always giving forth something. Choice of subject was very wide, and should be a primary object or the work would be like a poor actor speaking indifferent lines of an inconsiderable author. Technique was more imperative than to a painter, as he could always change his colours, but a sculptor's colours were confined to light and shade, his only other aids being line and form. Mere imitation of ornament by undercutting, such as laces, flowers, &c., of modern Italian work, had none of the solid majestic quality true sculpture demanded. Goldsmithery was different; its licence was unlimited; its mission was to please; it was a toy.

The first thing to consider in designing sculpture was whether it was for indoors or outdoors, monumental or ideal, as this would determine its treatment. There were two kinds of design, accidental and willed, and he would insist that they should give most of their love to the willed, for he saw work in the schools that smacked of flukes such as he evolved on the blackboard after flinging a sponge of colour against it and using the accidental mark as the basis of a design. Speaking of creative work he referred to the remarkable powers of Claude. Nothing was chanced, nothing fluked, everything was willed out of his observation, and he never pandered to fashion and commerce—he was not a mannerist. Flaxman certainly was a mannerist, but not commercial; he had not the advantage of studying the Elgin marbles, and the Roman-Graeco things by which he was trained, though admirable in their way, were not the highest expression of sculpture.

Study of the antique was good training, because it was approached as being the beautiful ideal of great artists, and, unconsciously, intuitively, the student absorbed effect-of-will-design, beauty of line and proportion. The really true was nearly always ugly, and as the students grew older they would find truth was most disagreeable. If truth were ugly, they must lie for all they were worth, and thus give truth the lie. Their duty was to eliminate all that was ugly in



BOARD SCHOOLS, CRESSING. CLARE AND ROSS, ARCHITECTS.

Nature; they must leave nothing behind them of which it could be said the artist was a great sculptor with ugly ideas.

SUBURBAN HOUSES.

The Discussion in Parliament on the new Bill.

THE Urban Site Value Rating Bill came up for its second reading in the House of Commons last Wednesday, but was rejected by a majority of seventy-one. In presenting the Bill, Mr. Trevelyan said that the effect of it would be a fundamental alteration in their system of local taxation and the addition of a source of revenue which had hitherto been largely neglected. With the rates at 6s. and 8s. in the £, he asked the House to consider what happened in regard to building on the outskirts of towns. If they took the assessment of a house at £50, only about £5 of that was probably land value and the whole of the rest of the burden of the 6s. and 8s. taxation was on the value of the buildings; that was to say, it was a direct tax of a very serious and severe kind on building, industry and improvement. The main proposal of the Bill was that the existing rating system should not be touched, but that side by side with it there should be a new valuation of the site value whether it was built upon or not; that it should be left to the municipalities to levy a rate up to 2s. in the £ upon the new assessment, and that this should go in relief of the ordinary rates in so far as they were applicable to ordinary town improvements. Mr. Harper, the valuer of the London County Council, had made a rough and approximate calculation as to what the effect of this tax would be in the case of London. He estimated that the land values of London came to something like £15,000,000, and that a 2s. in the £ rate would in that case meet as much as the County Council raised for its own special purposes. He proposed that the present ratepayer should pay the tax, that present contracts should remain untouched, and that in future contracts half the site-value rate should be payable by the owner. There had been great discussion as to whether it was possible to value sites separately from the buildings, but he would point out that in the case of many of their Colonies which had adopted this system for national as well as for local purposes not the least difficulty had been found in assessing the site value separate from the improvements, either in the town or in the country.

Mr. Griffith-Boscawen, in moving the rejection of the Bill, said that no machinery was provided in it for making the valuation, which was left to the various local authorities and assessment committees, and if it were adopted we should have purely arbitrary and conflicting values put upon sites by these bodies and nothing whatever would be gained. The Bill was, moreover, inequitable, because the tax would be put not only on land which had improved but on land which had depreciated. Hon. members seemed to think that there were

great landlord monopolists who were holding back their land and causing the congestion in our cities. It was thought that if they taxed these people they would make them build. A more unfair proposition he never heard of. A man had a right to build when he thought proper in his own interest, and if he were forced to build by an impost of this kind it would lead to jerry-building, the erection of a low class of house, and the creation of a low rateable value. If a man were allowed to follow his own interest, however, he would probably build houses of a superior class and bring into existence property which had a good rateable value. If the House passed the measure they would throw into the building market at once every open space which was not in the hands of the public and thus deprive the community of the advantage of them.

R.I.B.A. Prizes and Studentships, 1902-3.—*Essay medal and twenty-five guineas*: "A Comparative Review of the various Past and Present Systems of Architectural Training at Home and Abroad." *Soane Medallion and £100*: "Design for a Town Church on a Corner Site." *The Prize*: "Design for a Pavilion in a Public Garden." *Grissell Gold Medal and ten guineas*: "Design for a Stone Dome over a Porte-cochère to a large Public Hall." Other prizes as before. Copies of the pamphlet giving full particulars of these competitions can be obtained at the Institute (9, Conduit Street, W.), price 3d. each.

Schools at Cressing, Baintree.—This little building, designed by Messrs Clare & Ross, of Chelmsford, has recently been completed at a cost of £2,500. The interior is furnished throughout with a brown glazed-brick dado, capping and skirting, and the walls above are faced with carefully-selected Fletton bricks, flush pointed and distempered. Accommodation is provided for 200 children, and the school, which is divided by screens into three sections, can be thrown open to hold a meeting of 300 persons. The playground occupies a quarter of an acre and is surrounded by an unclimbable iron fence. On the east side of the school is a six-roomed house for the head-mistress. Mr. Frank Johnson, of Chelmsford, was the builder, and Mr. A. F. Horner, of Croydon, the clerk of works. Ventilation is by windows and "Offa" patent inlets, with openings in the ceiling and concealed roof ventilators for extraction. The rooms are warmed by Landers' patent grates, which supply warm fresh air to the classrooms and, by means of a supplementary flue on the back, are made to warm and ventilate the cloak-rooms as well. Swivel shutter partitions were supplied by the North of England School Furnishing Co. The walls outside are faced with local red bricks and the roofs covered with Tilberthwaite Westmorland green slates in diminishing courses. The windows are solid frames filled in with lead glazing and metal casements to opening lights. The ceilings are plastered and barrel-shaped throughout. The fencing was supplied by Messrs. Boulton & Paul, of Norwich.

THE CEMENT TRADE IN 1901.

MESSRS. TULLOCH & CO., the well-known brokers and exporters of English, German and Belgian cements, of 4, Fenchurch Avenue, London, E.C., state in their annual report (just issued) that, in common with most manufacturing industries, cement during 1901 suffered from the prevailing depression in the home and export trades. This applies equally to British and Continental works. In the United States (now a large producing market) 1901 marked a record consumption. Handicapped by high cost of manufacture, prices called for by the Thames and Medway "Associated" Works during the first six months rather tended to hold back buyers in the home trade, but towards the latter half of last year—with more disposition to meet competition—off-take improved. Some of the mills outside the "combine" are reported to have been fairly occupied throughout the year. The "associated" works, whose policy and tactics have been freely criticised, have fully justified their existence by their action in curtailing production and generally exercising a steadying effect on prices. Prices for January to June averaged about 27s. to 29s. per ton at the works, while July to December were easier at 25s. to 27s. Demand for export remained dull throughout the year. In round figures Messrs. Tulloch & Co. estimate total production of the United Kingdom at 2,200,000 tons. Total exports were 306,338 tons, showing a reduction of 53,606 tons as compared with 1900. The United States demand fell off 75 per cent., Canada nearly 50 per cent., latter market largely deserting their Mother Country in favour of American cements. Both British India and Australasia bought more heavily.

The "invasion" of German and Belgian cements into the United Kingdom continues and increases. During 1901 221,019 tons, as compared with 104,771 tons during 1900, are recorded for the total imports for the year. Prices for export fluctuated, starting early in 1901 at

6s. 3d. to 6s. 6d. per barrel for good standard brands, eventually dropping to 5s. 6d. to 5s. 9d. In Germany 1901 has been a record bad year. The history of the last twelve months only proves the futility of endeavouring to bolster up prices by "syndicates." Starting with heavy stocks, competition during the summer months became acute, especially from the more recently constructed works, who with large stocks and little spare capital were compelled to sell. General commercial depression, the reduction in consumption on public works, all helped to produce a severe crisis in the trade. The virtual break up of the "Hanover Syndicate" and a recognition by the "Hamburg Syndicate" of the situation may help the return of a more healthy condition, and the wise policy of the leading works in reducing production has already had a good effect. The estimated total output of the German mills for 1901 is put at 3,357,500 tons. Export demand ruled quiet, prices declining from Ms. 5.75 and Ms. 6.50 to Ms. 5 and Ms. 5.50.

In Belgium, production exceeded demand, especially in the case of those works manufacturing artificial cements. Well-known brands, selling twelve months ago at 6s. per barrel, are purchasable to-day at 5s. to 5s. 3d., but for distant delivery there is a steadier feeling. The estimated total output for 1901 of artificial cements—of which North's and Jossen take the lead—is put at 250,000 tons, of which about 75,000 tons were employed for local consumption. The natural cement industry also suffered, but chiefly as regards the lower qualities. Over-supply in the case of first-quality cements was less marked, the leading works finding purchasers in the United Kingdom for over 170,000 tons during 1901. Total exports for the year of artificial and natural cements were 491,672 tons, as compared with 408,283 tons during 1900.

In the United States the enlargement of existing mills, and the erection of many new ones, caused a large increase in production. Competition became keen and prices were cut below

a remunerative level. The determined attempts to capture the trade of adjacent countries, notably Canada, indicates that we shall have to reckon before long with the United States of America as a powerful export competitor.

In conclusion, prospects of any material improvement in selling values seem remote. Low prices will assist in increasing consumption and in time adjusting supply to demand. If only manufacturers would adopt a less optimistic view as to the rate of increase in the world's consumption and recognise the general tendency of foreign markets to become their own suppliers by establishing local works, the return to a healthier condition of trade would, we think, be more speedily accomplished.

Royal Academy Exhibition, 1902.

The receiving day for architectural works is Thursday, March 27th. We shall be pleased, as in previous years, to receive drawings from intending exhibitors and to forward them (free of expense) to Burlington House. In order that careful reproductions may be made for publication, it is requested that drawings be sent as early as possible. No drawings can be received by us later than noon on the sending-in day.

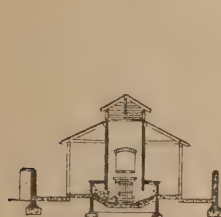
Correspondence.

"Papyrolith" and Cork Paving.

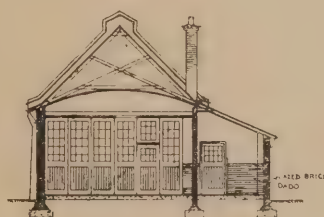
To the Editor of THE BUILDERS' JOURNAL, OXFORD.

SIR,—Referring to your correspondent's letter on p. 456 of your issue for February 12th, the makers of the first-named paving are The Papyrolith Flooring Co., Ltd., Dashwood House, Old Broad Street, E.C. The Improved Cork Paving Co. seems to have disappeared from the "advertising world."—Yours truly,

GILBERT T. GARDNER.



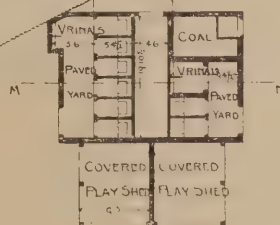
SECTION M.M.



SECTION C.D.



FIRST FLOOR PLAN



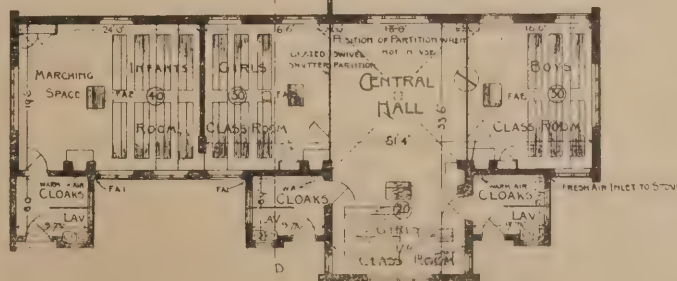
GIRLS & INFANTS PLAYGROUND

BOYS PLAYGROUND

TEACHERS RESIDENCE



GROUND FLOOR PLAN



PLAN.

BUILDING CONSTRUCTION.

(Concluded from p. 454, No. 266.)

THE student should carefully read and understand the rules issued by fire insurance companies for the "wiring" of houses. The modes in which fires may be produced by electric wires are different from those in which they are occasioned by gas, petroleum or candles. It is, for example, safer to read in bed by electricity than by other lights; there is no danger from the glowing filament. Electricity will not "explode," but just as a lighted match or candle will explode a mixture of gas and air, a tiny spark of electricity (as everyone who uses an electric gas-lighter knows) will set fire to an explosive mixture of gas and oxygen. Besides this there are two ways in which electric conductors may directly occasion fires. The student should know the rough-and-ready use of the

formula which is called Ohm's law: it is $C = \frac{E}{R}$ or any form into which this equation may be algebraically put. C is the current in amperes; E , for our purpose, is the difference of potential in volts; and R is the resistance in ohms. Con-

battery.) Compare the battery to the heart of an animal: it is a pump which keeps the animal's blood circulating continuously. The blood circulates because the action of the heart maintains the liquid blood at one side of a diaphragm at a higher pressure than at the other side. If the heart moves weakly there is a reduction of difference of pressure and there is a small current; if it stops there is no difference of pressure and there is no current. The amount of steady current depends on the strength and power of the heart, and so it is with the bell battery, it can only maintain its electro-motive force by its chemical activity, and so when R is diminished by pressing the button the drain upon the energy of the battery is no more than it can supply and E diminishes: the power of the battery is $E C$, and this is in ordinary bell batteries a very small quantity. The student may see a spark when the circuit is broken at a bell push and he will see a continuous stream of faint sparks at the spring contact of a trembling bell. Such sparking might explode a mixture of gas and air, but it will not set fire to wood or material of that kind. Now mark the difference between such a current and the current which is supplied from a central supply station; the heart of the circulation here is the big dynamos and

= 55 amperes. The heating effect is proportionate to the square of the current. $\frac{55 \times 110}{746}$

= watts
= watts in a horse-power = 8.1 horse-power
applied at once to the business of heating this wire and burning the house. Wiring should be done so as to avoid the possibility of such a thing happening, and this is the object of the Fire Office rules. If the conductor is of uniform cross-section and material the whole conductor will be uniformly heated, as is the case with a lamp filament; but if it is smaller in cross-section at any particular part the heating will be greater at this part: if the part is so proportioned that a very small quantity of heat will produce a temperature which will destroy this part and also that it will not introduce so much resistance as will interfere with the voltage at the lamp terminals, the part will be destroyed before the current is sufficiently large or long continued as to dangerously heat the conductor as a whole and in this way interrupt the circuit. As has been already explained such a part is called a *cut-out*.

It is useful for a practical man to have a familiar analogue to help his memory of the phenomena of such things as electric currents. The heart and blood of an animal have been made use of above; it is perhaps better to use the idea of water flowing through a continuous pipe kept circulating by a pump. We have the quantity of water per minute depending on the difference of pressure at the two sides of the pump and the friction in the system, and to this Ohm's law will apply when everything is in steady work; but if the flow is suddenly stopped Ohm's law will not apply because in addition to the steady pressure of the pump you now have the pressure of a mass of moving water being suddenly brought to rest—a pressure which depends upon the rapidity of the stoppage and the elasticity of the pipe and of the obstruction. Besides the great pressure at one side of the obstruction there is a relief of pressure at the other side, because if the water jams up at the first side it must slightly leave the other side, and if we imagine a fine tube connecting these two regions water will pass through it with tremendous velocity. A like phenomenon occurs when an electric circuit is interrupted. Suppose there is a steady flow in the circuit A B C D (Fig. 115) and that at B D two wires are close together with thin insulation, and a small air-space between, a sudden break in the circuit at A may cause a spark to leap across at B and set up an arc which will continue till the wires are consumed to such an extent that the gap is formed wider than the arcing distance for the voltage. Call this No. 1 of the two ways in which fires may be occasioned by electric conductors. No. 2 is when a conductor is over-heated by being called upon to carry too heavy a current for its cross-section, and this may arise either from the conductor being too small in cross-section for its work or from a partial or absolute short circuit in its course. Every current of electricity heats the conductor through which it flows, but the conductor is subjected to cooling influences, currents of air, radiation, conduction: the current must not be greater than that the cooling influences at moderate temperatures will equal the heating value of the current. The rule one hears most frequently quoted is 1,000 amperes per sq. in. of section of copper conductor; but wiring men appear to forget frequently that in addition to safety from fire there is another matter that must not be lost sight of, and that is the loss of voltage at distant lamps. To have the lamps of an installation burn equally bright the resistance between every lamp and the meter should be as nearly as possible the same. This ideal cannot be exactly reached, because the conditions vary with the number of lamps which may happen to be used at any particular time.

(a) Let A B (Fig. 116) represent a pair of conductors with lamps connected across them, and suppose the conductors to be of the same cross-section from A to B, it is manifest that lamp 1 has less resistance between it and A than lamp 18 has.

(b) Let A' B' (Fig. 117) represent a different system. It will be seen by inspection that B gives an equal resistance all round and lamp 1 will burn with the same brightness as lamp 18, and this will

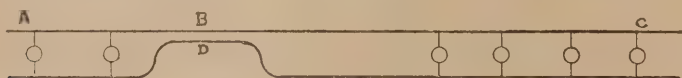


FIG. 115.

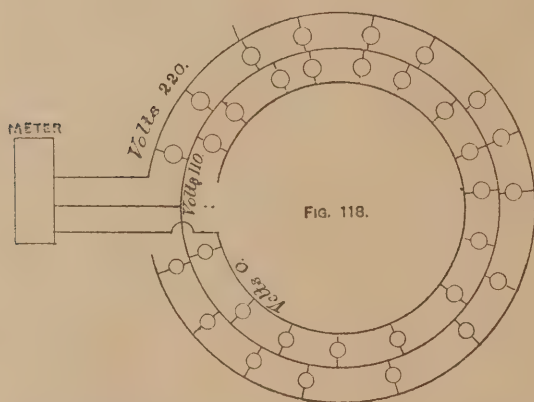


FIG. 116.

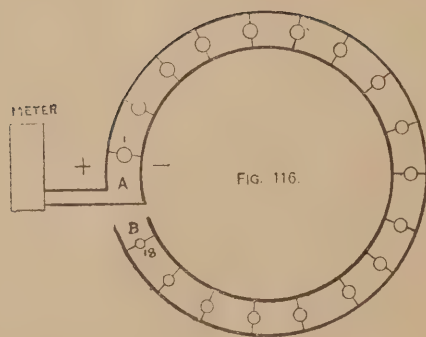


FIG. 117.

consider this formula in connection with electric bells. When the wires are well insulated the gap in the circuit at a push makes R for the voltages of such circuits infinite, consequently $C = 0$; no current flows and no bell rings. When the push is pressed, why does not the current become infinite, because now the resistance R between the points is 0? If we consider that there is a small charge of electricity at the + point this passes at once, and we may think of the action as that of a very large current for a very short time: the instant that the circuit is completed R does not stand for the resistance between the points but for that of the whole circuit, viz., the wires to the battery, the bell, the indicator and the battery itself; and E is now called electro-motive force. It is not easy to get a mental conception of electro-motive force. (I want to avoid the introduction of the subject of dynamos here, but students of electricity know that a constant current dynamo is a mechanical substitute for a primary chemical

steam engines, which, unlike the tiny generator—a bell battery—will answer any demand for power that may be made upon it. Consider an ordinary 16-c.p. incandescent lamp, assume its current to be .5 amperes and its difference of potential (the voltage between its terminals) to be 110, apply Ohm's law and we find $.5 = \frac{110}{R}$ $\therefore R = 220$. That is, the resistance of

the lamp is 220 ohms, and the energy that is converted to heat and light is 55 watts per hour, say (C E). Suppose that this lamp is on a circuit from the service, allowing for 1 volt drop, the resistance of this circuit if it were short-circuited at the lamp as a bell push short-circuits a bell circuit, the lamp being left out, if found by Ohm's law $.5 = \frac{1}{R}$ $\therefore R = 2$. Now

let us see what current we should get in this wire by short-circuiting a lamp, $C = \frac{110}{2}$

always be the case however many or few lamps may be in use, but each lamp will not burn so brightly when they are all "on" as when only a small number are "on." Reasonable uniformity can only be attained by making use of the considerations here suggested in a common-sense way, by a sufficiently liberal use of copper, and by arranging the installation in a sufficient number of independent circuits so that there will not be too great variations in the numbers of lamps in use in any one circuit.

It is possible to do very careless and unsatisfactory wiring without infringing the Fire Office rules. The Fire Offices are only concerned with the prevention of fire; the householder is concerned in getting fair value for the money he pays for electricity and for lamp renewals. With bad wiring the lamps burn too high when few of them are in use and too low when many are in use; high burning means numerous lamp renewals, low burning means very inefficient light for the "units" charged in the electricity bill. The way in which architects may control this matter is obvious. Specify that the drop in volts at any lamp terminal from the meter shall not exceed a given amount when all the lamps are turned on and that when lamps burn in small numbers the drop shall be a given amount.

When a building is wired in sections the terminals of each section should be brought to a switchboard located as close to the meter as possible and there should be switches and cut-outs for each circuit.

The student will find it useful to get some of the very well illustrated catalogues of electrical fittings and study them; he should also examine the fittings themselves, and he is strongly advised to examine carefully any electrically-fitted building which he is at liberty to examine, and if he can borrow a voltmeter he should try the voltages at lamp sockets when varying numbers of lamps are burning.

Electric Light.—There has been much said about the difference between *electric light* and *gas light*. Gas light is supposed to have a better fog-penetrating power, &c. As a matter of fact there is no difference in the light from gas burned as an ordinary flame and that from electricity: there is as much electric quality in the one as in the other; in both cases the source of light is heated glowing carbon. In incandescent gas burners the source of light is the glowing mantle and in the Nernst electric lamps the source is not carbon. But electricity gives a greater range of temperature in the glowing carbon. We have the very high temperature arc light, and there is a very great range in incandescent lamps, which may be burned as dull as ever we please. When burned dull, however, they are very uneconomical. Fog-penetrating power may be influenced by the smallness of the source in an arc light, or it may be a question of the refrangibility of the rays. It would appear that electric light may be obtained from as large a source as may be desired and of almost any refrangibility. The light from the incandescent filament of an electric lamp is no more electric than the light from a candle, from a bat'swing gas burner or from the flame of the fire.

High-voltage Lamps.—The drop in voltage on a given length of conductor is proportional to the current; for example, if the drop for a current of 100 amperes is 5 volts the drop for 50 amperes will be 2½ volts. Now, if the voltage at which the 100-ampere current is sent out is 100, the voltage at which it will be used between the terminals of a lamp is 95 and the watts usefully employed are $100 \times 95 = 9,500$ watts. But if the current is sent out at 200 volts, 50 amperes at 200 volts is equal to 100 amperes at 100 volts, but the drop in volts for 50 amperes is only 2½ volts, so that the power delivered to the lamp terminals is $50 \times 97\frac{1}{2} = 9,875$ watts, so that there is a considerable economy of energy in using the higher-voltage lamp. Instead of the loss of power being 5 per cent, it is now only 1.25 per cent., that is, one-fourth of 5 per cent. If we agree to the 5 per cent. loss of power we may reduce the copper in the conductor to one-fourth: that is, a 50-ampere current will have a drop of 10 volts and we shall have at the lamp terminals $50 \times 190 = 9,500$, as in the first example. Doubling the voltage on a system increases the power-conveying capacity of the conductors

four times, having regard to allowable drop of voltage at the lamps. Increasing the voltage has other consequences; the sparking distance becomes greater and better insulation is needed, but the reason why the voltage of lamps for central supply was at first made about 100 was connected with the manufacture of the lamps. If the filament of an 8-candle lamp for a voltage of 100 is doubled in length it will now give 16 candles on a voltage of 200, or if its cross-sectional area can be halved the same result will follow. It is now found practicable to make satisfactory higher voltage (220) lamps for candle-powers of 16 and more.

In large buildings it may be advisable to bring in the three-wire system from the three-wire supply, and it is advisable to say something on this subject. It is said above that doubling the length of an 8-candle lamp filament allows the voltage to be doubled, and it now gives light equal to that of two lamps; the same result will follow if we put two lamps in series across the higher voltage. The objection to this plan is that in all cases the lamps must burn in pairs and if either fails the other goes out. Consider Fig. 118. Three conductors come from the meter of the voltages shown. If all the lamps are burning there is no current in the conductor at 110 volts, except as may be needed to go from one lamp to the second of a pair, but if the balance is disturbed by, say, three 16-c.p. lamps of the outer ring being switched off, then a current of, say, 1½ amperes flows from the meter to the middle wire. On the other hand, if, say, four lamps of the inner circle are switched off, a current of 2 amperes will flow to the meter. As the middle wire is for a balancing current and as the lamps are arranged so that it is very unlikely that all those on one side shall be lighting when all the lamps on the other side are out, the middle conductor may be less in cross-section than either of the others. The quantity of copper in these conductors as compared with that in a two-wire installation with 110-volt lamps is about three-eighths.

The few elementary matters discussed above are the mental electrical stock-in-trade of a practical foreman of house-wiring. The house-owner, or the architect who is acting for him, may feel safe in the hands of very well-known reputable wiring firms, but there is a legion of wiring people: let us consider what checks are applied to them apart from their reputation. The Supply Company must be satisfied with the goodness of the work. It is the interest of supply companies to keep up the good name of electricity as a safe agent, and it was especially so at the beginning of its use; it is less so now that the public have settled in their minds an average sentiment of security, and, so far as the Supply Company is directly concerned, it is sufficient for them in the interests of their mains and services to see that the main switch and cut-out on the street side of the meter are right. Again, the Fire Office: it is its interest to see that the rules are complied with, but the Fire Office will accept a certificate from the Supply Company or even from the person who has done the wiring. If the architect is unable to judge of house-wiring there is no sufficient security.

In regard to the placing of lights and their decorative management there is nothing technically electric; it is outside the scope of this article.

The Newport (I.W.) Victoria Memorial.—The competition for designs for an island memorial to Queen Victoria, which it has been decided to erect on a site in the market square of Newport, has been decided in favour of Mr. Percy Stone, F.S.A., of Sandown, who won the premium of £25. About fifty competitive designs were received. The design submitted under the motto "Vectis" shows a memorial in the form of a Victoria Cross on a graceful column nearly 40ft. high, with a lantern of Gothic design surmounted by a spire and the cross. At the base of the column will be three figures, representing Dignity, Fortitude and Sympathy, supporting a crown, with three couched lions at their feet. The whole will stand on a circular base with four steps. The selected design possesses the unique characteristic that from whatever side the monument is approached its appearance will be the same. Two designs by London competitors were placed next in order of merit.

OLD AND NEW STAINED GLASS.*

By H. W. BACON.

STAINED glass is a subject upon which much may be said, but little that is new. Its history is lost in the midst of antiquity—of coloured glass there are in existence Egyptian beads and odds and ends more than 3,000 years old—and, if legends are to be believed, the Tower of Babel itself is responsible for the invention of glass by the vitrification of its building materials in the destructive fire consequent on its presumptuous existence, but one has to wait a considerable time after the Tower of Babel for any evidence of a stained-glass window.

The earliest date ascribed to any existing stained glass is to the tenth- or eleventh-century windows at Augsburg, but even this is doubtful, though it is more than probable coloured glass had been used for window purposes some time before.

The oldest we have in England dates from about the thirteenth century, but as in the development of stained glass we were always about a century behind our French neighbours I think we may fairly state that its use became somewhat general about the twelfth century. There is a good deal of it about that date remaining in various French churches. The first stained-glass windows were (paradoxical as it seems) of white glass, that is to say, of various tints of white glazed together into geometrical forms, technically called *grisaille*. Later, small pieces of coloured glass were introduced as centres of circles and other panels; still later, borders of colour were used to frame the lights; and gradually coloured glass ousted the white, until it could no longer be called *grisaille*. All this time no paint had been used: the effects gained were solely by the tint or colour inherent in the glass itself.

At this point the interesting discovery was made that opaque glass, or the component parts of glass in a raw state, might be finely powdered, mixed with water or other media, and painted with a brush on a sheet of glass, and fused by heat to its surface.

Until now the art had been that of the glazier; here the painter appears on the scene; and, simply at first and more elaborately later, natural forms begin to take their place in the window.

The painter's side of stained glass took greater and still greater prominence, the glazier's less and less, through the Early, Decorated and Late Gothic, through the Renaissance, down to the late seventeenth century, when the painter smothered the glazier, and the art became dead and buried.

The efforts of some later painters, notably Sir Joshua Reynolds, only prove how very dead it was, how little they understood of its *raison d'être*. Dead it remained until well into the nineteenth century, when came the elder Pugin. Thanks to him the dry bones were stirred, and though some of us are now inclined to smile at the early and archaic efforts of this master, yet we are compelled to admit that he, first among moderns, understood anything of the principles underlying stained glass.

I believe I am right in saying that almost all living stained-glass artists of repute trace their genealogical artistry to one or other of Pugin's protégés—Mr. Wailes, of Newcastle, or Mr. Hardman, of Birmingham. All-round progress has taken place since then; we have survived the dogmatism of a Pugin and the obstinacy of a Butterfield, until, perhaps, we are in danger of falling under a still worse régime—that of the crank.

Having thus lightly touched on the history and development of the subject, I should like to offer my conception of what a stained-glass window should be, the methods of its making, and a few remarks on present-day artists and clients.

My definition of a stained-glass window is something like this:—A mosaic of vari-coloured glass so designed as to fittingly decorate and emphasize its architectural framework—and at the same time to fulfil its other purpose, *i.e.*, the illumination of the building in which it is

* Summary of a paper read before the Society of Architects on February 20th.

inserted: a mosaic of vari-coloured glass sets aside all systems whereby colour is gained by means of enamel, paint, &c. It must be fittingly decorative—that is, the subject must bear some relation to the purpose of the building, not at all like the exterior of the chemist's shop illustrated in Newcastle Cathedral.

It must emphasize its stone framing; therefore each panel must be complete in itself. No picture running through a number of lights, ignoring all boundaries and mullions, is admissible. In addition, I think it should be readable, not a puzzle—so that an interested observer should be able to gather the main lines of its story at once, still leaving the articulation of the details to closer search.

I should like you to notice how the layman in these matters assumes that what is suitable in a

sary, limitation. I may be wrong and am open to conviction, for possibly the most exquisite examples of glass painting in existence ignore the rule, notably at Gouda, in Holland, where Gothic windows of many mullions were deliberately built for the reception of Renaissance glass. It must be confessed that in these magnificent works the presence of stone mullions is not even noticed; but that is my point, ought they not to be noticed? Possibly the truth is that in windows of the size of those at Gouda, the mullions are of no more consideration than stanchion bars—something on which to hang glass and prevent its collapse.

One often sees windows the apparent object of which is to darken rather than light the building—the large east window at St. Mathias, Earl's Court, is a case in point. To such an

glass-painter is usually but a workman, a mechanical copyist; on the Continent painters are really qualified artists and only need the roughest suggestions from the master-mind. In our country, therefore, the drawings must be elaborate and drawn with minute care: nothing can be left to the copyist's imagination, for the simple reason that generally he hasn't any, though there are exceptions.

The figure drawings are made in monochrome, charcoal, crayon, pencil, or bistre in wash, or in water-colour or pastel. Generally the lead glazing lines are shown on the drawing, but for the convenience of the cutter a tracing of these lines is made on linen.

Possibly the most important and delicate function in the making of a window now follows. Each piece of coloured glass must be chosen and cut to fit the shape on the linen tracing. In the case of purely commercial stained-window producers, the cutter, an ordinary British workman, is left very much to his own devices; but where artistic glass is aimed at the artist stands by the cutter, choosing each tint, each sheet, and even indicating the particular part of each sheet most suitable for his purpose.

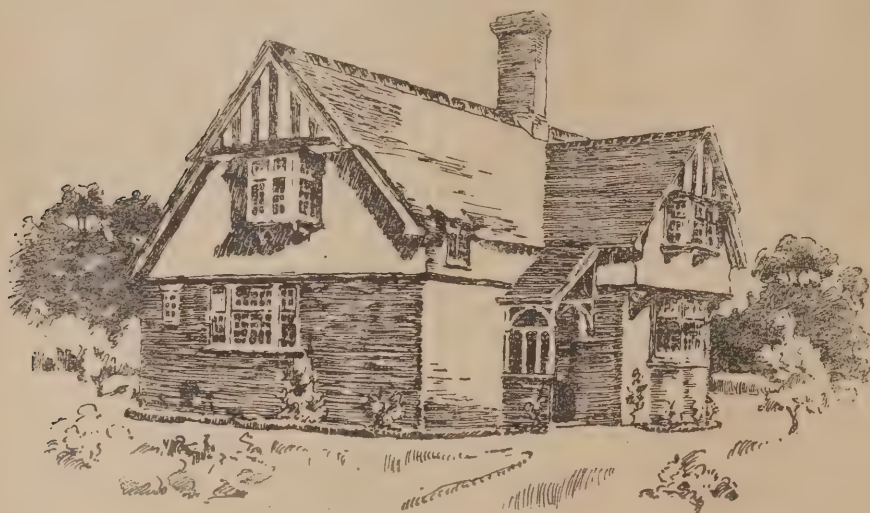
This done, a tracer takes the glass in hand, marking on the pieces of glass the main lines of the artist's drawing. The colour used for this tracing and all subsequent painting on the glass is an opaque brown pigment, composed of the same earths as glass itself, with some iron or copper added to give opacity. The next process is to stick on to a sheet of plate glass with hot wax all the pieces placed in their proper order and position, and the whole is then covered with a fairly thick coat of the pigment, and, while still wet, stippled to let the light through. When dry, by means of an odd assortment of tools—needles, quills, bits of stick and hard hogshair brushes—the lights and half-tones are picked out or brushed away; here and there a shadow needs strengthening with more pigment, and the work is ready for diapering and staining. The diapers or patterns on the drapery are done in two ways, sometimes painted on in thick opaque lines, and sometimes the existing paint is etched out with points to the required design. The staining consists in painting the back of such portions of the glass as seems desirable with nitrate of silver, which when sufficiently heated turns a pure brilliant yellow and can very easily be so manipulated as to give the very palest lemon shades or the deepest orange, almost red.

The pieces of glass are now all dismantled and carefully laid flat on iron trays, no piece touching another, inserted into a kiln, and gradually heated to a white heat and as gradually cooled. The pigment is now just as much a part and parcel of the glass on which it was painted as if it had been originally made in that condition. It is itself no longer paint, but glass, and can only be separated from the surface by the action of hydrofluoric acid.

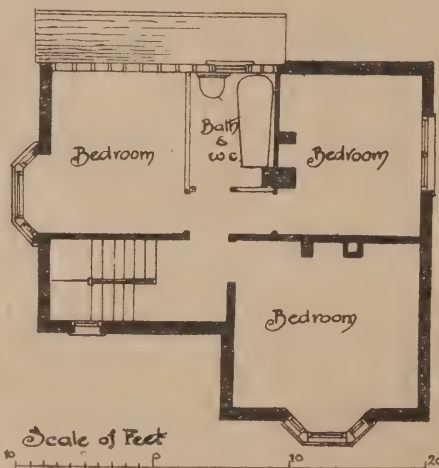
The glazier now takes the work in hand and sorts out this seemingly hopeless jumble of odds and ends by means of the cutter's tracing linen and joins them all together by grooved leads and solder. Cement is rubbed into the leads on both sides and pieces of stout copper wire are fastened in place which will ultimately be twisted round iron bars in the stonework.

It is a constant wonderment that, while art in almost every form is becoming more refined and respected, the art of glass painting and staining should be so largely a matter of trade, and sometimes not even being subject to ordinary trade standards of morality. If you will look up in the directory the names of so-called stained-glass artists you will come upon firm after firm not one of whose members can even draw, while every year in the Royal Academy there are designs for windows hanging on the walls signed by men who have done nothing but pay for them.

The Administration Cottage illustrated on this page was designed for the nursing staff in connection with the Frimley Urban District Council's proposed isolation hospital, in respect of which application is to be made to the Local Government Board for sanction to borrow £3,500. The walls on the ground floor will be built in red bricks, whilst the upper portion will be covered with rough-cast and the roof with Reading tiles. Mr. F. C. Uren, surveyor to the Council, is the architect.



GROUND PLAN.



FIRST-FLOOR PLAN.

SKETCH DESIGN FOR ADMINISTRATION COTTAGE, FRIMLEY URBAN DISTRICT COUNCIL ISOLATION HOSPITAL. F. C. UREN, ARCHITECT.

picture on canvas is and must be suitable as a decoration in glass: an error in which, curiously enough, he is supported by the great writer on glass, Winston, who in his monumental work says in effect that nothing is admissible in glass but what is admissible on canvas. Speaking for myself and many contemporary workers, it seems nearer the truth to say nothing is admissible in glass which is admissible on canvas.

Another of my rules says the subject of decoration must be complete within the limits of its framework—by this I mean that no picture should over-run the stop set by stone mullions or overflow into tracery. This is a rule, if rule it be, quite as generally broken as observed. I am well aware that many if not all modern glass-painters have no hesitation in carrying one design through five or more lights. I know perfectly well that examples of old work of similar character are numerous.

Yet I feel that proper recognition of the architectural stonework is a legitimate, even a neces-

sary, limitation. I may be wrong and am open to conviction, for possibly the most exquisite examples of glass painting in existence ignore the rule, notably at Gouda, in Holland, where Gothic windows of many mullions were deliberately built for the reception of Renaissance glass. It must be confessed that in these magnificent works the presence of stone mullions is not even noticed; but that is my point, ought they not to be noticed? Possibly the truth is that in windows of the size of those at Gouda, the mullions are of no more consideration than stanchion bars—something on which to hang glass and prevent its collapse.

I now propose to describe briefly the course of execution of a painted window.

To begin at the beginning, as soon as the exact shape and proposed subject are known a water-colour sketch or design is prepared to scale, and here a preliminary difficulty often presents itself, the question of cost. It is really absurd to merely state a given size and then ask the cost, as some architects have been known to do. Stained glass may cost anything, for the cost depends on many and various considerations, chief among them being the standing of the artist employed. No sane person would write to a bootmaker, "What is the price of a pair of boots, size No. 7?"

This question of cost settled, the design is made, then the full-size working drawings. In England, unhappily, though the resultant glass is now the best in the world the actual

Bricks and Mortar.

APHORISM FOR THE WEEK.

The houses of Pompeii were second-rate performances in their age, but for wealth of art throughout them, and unity of design down to the smallest details, our richest mansions cannot compare with them.—J. J. STEVENSON ("House Architecture").

Our Plates. CLEGG HALL is about two miles from Rochdale, in the Littleborough direction. It was built by William Asheton about the latter part of the reign of Queen Elizabeth. The bold portico at the front was built later, no doubt in the reign of William. It is of Renaissance design, but the details are coarse. There is a sketch of the Hall in Gotch's "Early Renaissance Architecture" recently published.—The vicarage of St. Mary's, Plaistow, was built some years ago for the Rev. T. G. Wilson from designs by Mr. Arthur C. Blomfield. The work was carried out by Messrs. Cornish & Gaymer, of North Walsham, and the house is built of red brick and hanging tiles.—The two farmhouses in Sussex were designed for a gentleman who owns a large estate in that county and who proposes to subdivide it into smaller farms than those at present existing. The houses are designed to be carried out in local red bricks and tiles, with half-timbered gables in oak.

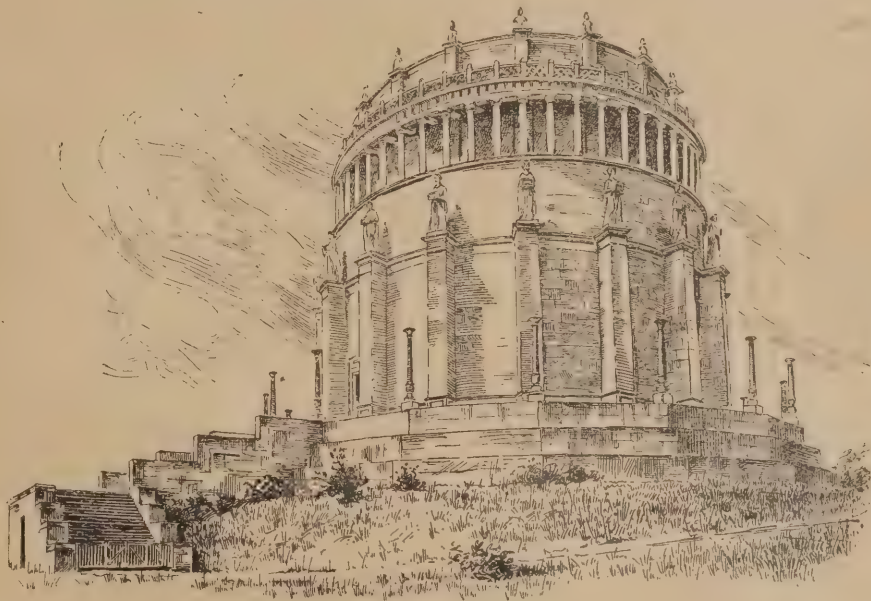
York Architectural Society. THE "Report of Proceedings" of the York Architectural Society for 1900-1 includes the correspondence entered into by this Society and the R.I.B.A. in reference to the decision of the York Corporation to erect a lunatic asylum from the designs of the city engineer. Whilst disclaiming any personal objection, or wishing to suggest anything detrimental to the city engineer, the Society pointed out that "(a) the plainest buildings need architectural treatment in order to secure avoidance of the commonplace; (b) a building of the asylum class demands special knowledge on the part of the designer, or experience may be dearly bought by trouble and cost in future adaptation and administration; (c) the increasing demands upon the time and energy of the city engineer would indicate that it is improbable that he will be able to do full justice to the work, and the result of this must be the practical delegation of the responsibility to some special assistant." The protest however was in vain, for the York City Council decided "not to depart from the course of action they have already taken." The "Report of Proceedings" has as frontispiece an illustration of the south facade of Castle Howard, while the prize list for 1902 includes one of £1 ls. for the best sketches and memoranda made at the visits of the Photographic and Sketching Section, and two of £3 3s. and £1 ls. respectively for the best designs for a small fever hospital.

Church Art. THE Church Crafts League held its first general meeting of the year last Monday week in the hall of Clifford's Inn, when Mr. Roger Fry gave a lecture on "Art Patronage of the Church in Italy during the Fifteenth Century." At the conclusion of the lecture Mr. Charles Holroyd (Keeper of the Tate Gallery) said it was the custom in the fifteenth century for a wealthy family to make itself responsible for the decoration of a certain portion of a church and to employ the best artist it could procure to carry out the work. He thought that some such plan might be adopted now with good results. Mr. Selwyn Image protested against the idea that one man must be responsible for all the decorative work of a church. If real artists were employed they would all be actuated by the same spirit, and the result of work done in such a way would not be lacking in unity of purpose. Mr. Henry Holiday briefly mentioned the drawbacks under which modern artists had to learn the technique of their art. Instead of being taught in schools by the best men of their day, the young artists had to spend years of independent labour in mastering technical difficulties.

A Scottish Architect. MR. DAVID MACGIBBON, LL.D., architect, of the firm of Messrs. MacGibbon & Ross, of Edinburgh, died last week in his seventy-first year. Mr. MacGibbon had been in feeble health for two years, and had been taking no part in professional work for the past year. Educated at the High School and at the University of Edinburgh, he learned his profession in that city and in London. He travelled a good deal on the Continent, in Italy, France and Spain, and the fruits of his travel and ripe scholarship were shown in the publication which he brought out in collaboration with his partner, Mr. Thomas Ross. The work extends to eight volumes, and deals with the castellated and domestic architecture of Scotland and the ecclesiastical architecture of Scotland. Recently Mr. MacGibbon published a large book, for private circulation, on "The Abbeys of Galloway," and also a volume on "The Architecture of the Riviera." Mr. MacGibbon likewise contributed many papers to the architectural institutes, both in London and Edinburgh. Several of the finest buildings in Edinburgh were designed by Mr. MacGibbon. He was the architect for the Merchant Company, and, besides designing their schools, he was responsible for the laying-out of their feuing grounds. Many of the buildings of the National Bank of Scotland throughout all parts of Scot-

234ft. in height, but in the reconstruction it was considered advisable to materially reduce the length. St. Bride's was opened in 1680, but the tower and spire were not added until 1701-1703, this completion bringing the cost of the church up to £11,430. In the reconstruction which has now been undertaken the spire will remain at the altitude at which it has existed since 1764.

Last Year's Work on at Caerwent. The excavation work carried on at Caerwent in 1901 consisted mainly in the excavation of the west wing of house No. 2 and the whole of house No. 7 in the nine-acre field in the south-west quarter of the city. The two houses were of unusual interest. They were both large houses of the courtyard type, but they differed from the type commonly found at Silchester in having suites of rooms arranged round all four sides of the central court, whereas at Silchester the courtyard type of house usually has rooms on three sides only. In house No. 2 a large and very interesting hypocaust was found in which the *pila*, each formed of a single stone, actually rested on a tessellated pavement (still intact) of the earlier house. This hypocaust was doubly interesting owing to the fact that the floor and the overlying pavement were still *in situ*, and afforded a good example of the method of sup-



THE BEFREIUNGSHALLE, KELHEIM, BAVARIA.

land were erected from his designs. In Edinburgh his work is to be seen in several of the fronts in Princes Street, in the Caledonian Insurance Company's office in George Street, and in the Theatre Royal. Mr. MacGibbon was an accomplished draughtsman and a water-colour artist of some repute. About two years ago the University of St. Andrews conferred upon him the honorary degree of LL.D., in recognition of his artistic attainments.

St. Bride's Steeple.

THE steeple of St. Bride's, the body of which church has heretofore been hidden behind some of the Fleet Street shops, and is now masked by hoardings which conceal the operation of widening the thoroughfare, is at the present moment shrouded in scaffolding. For many months the necessity of repairing some of the masonry has pressed upon the Charity Commissioners, and it has now been decided to rebuild some section of the spire, and to otherwise make good the ravages of the smoke and weather of London. At the same time the London sparrow is accountable for more mischief to the buildings of the metropolis than is usually laid to his account, and the ringing of bells also makes strains upon the masonry wherein they are hung. This will be the second time that the steeple of this interesting work of Wren will have been restored. It had to be rebuilt in 1764; when it was struck by lightning and seriously damaged. At that time it was

porting the floor. A portion of the hypocaust has been removed and re-erected in the temporary museum. The other most important features in this house were a channelled hypocaust and a series of small baths, in one of which the leaden drain-pipe was still to be seen as it passed through the wall. The chief features of interest in house No. 7 were a small partially detached building, which may have been a shrine, and two rooms (separated no doubt only by a curtain when the house was in use) which contained a tessellated pavement in which were busts of the Seasons and figures of animals and of cupids. Underlying this pavement, which was of late and inferior workmanship, was another (of the earlier house) constructed with far more care as to detail and finish. In both these rooms the walls were standing to a height of nearly 3ft. above the floor level, and the plaster on the walls was nearly intact. It was, therefore, fortunately possible to recover to a considerable extent the colour and design of the wall decoration. Among the various objects found, perhaps the most interesting was a small plaque of thin bronze containing in high relief a female head. It is hoped to resume work early in this summer; but the funds raised last year have all been expended, and it will be necessary to raise a large sum—at least £300—to enable the committee to complete the excavation of the nine acres already in their occupation. Subscriptions for this year should be sent to the hon. treasurer, Mr. A. E. Hudd, F.S.A., 94, Pembroke Road, Clifton, Bristol.

THE L.C.C. WORKS DEPARTMENT.

BEFORE the London County Council sat last week a portrait of Mr. W. H. Dickinson (chairman 1900-1), executed by the Hon. J. Collier, was unveiled in the library.

A report was brought up by the General Purposes Committee dealing with the Works Department, and making the following recommendations: "(a) That an advertisement be issued inviting applications for the appointment of Manager of Works, and that the salary to be attached to the position be £1,500 a year as at present; (b) that a standing Committee, consisting of seven members, be appointed for the supervision of the Works Department, and that such Committee be styled the Works Committee."

Sir John Dickson-Poynder, M.P., moved, as an amendment: "That the Works Department should only be continued for the purpose of completing the works in hand, and no new constructive works be undertaken, and accordingly that it be referred to the General Purposes Committee to report fully as to the appointment of a temporary manager." If he had his own way he would wind up the Department tomorrow. But, of course, this could not be done. Nearly £750,000 worth of work was now being carried out by the Department, and he proposed that they should all co-operate together to carry out that work on the clear understanding that

of £7,000. On jobbing works there was a large saving, and the result was that the total excess on the work carried out under the present management was only £377.

After further discussion the amendment was defeated by a large majority. Other amendments to appoint an Advisory Committee to consider the question of the reorganisation of the Works Department prior to the appointment of a new Works Manager, and to substitute £1,000 for £1,500, were lost.

Ultimately both recommendations of the General Purposes Committee were carried.

Surveying and Sanitary Notes.

Sir Alexander Binnie will preside over the engineering and architectural section at the congress to be held by the Sanitary Institute at Manchester in September next.

The Widening of Piccadilly near the Circus is not to be undertaken just yet, as the cost would be something like £250,000. The Commissioners of Woods and Forests decline to assist the London County Council in the matter.

Bacteria and Sanitation.—At a large meeting of the Devon and Exeter Architectural Society held

cussion was joined in by Mr. C. J. Tait, Mr. C. Cole and Mr. O. Ralling.

Builders' Notes.

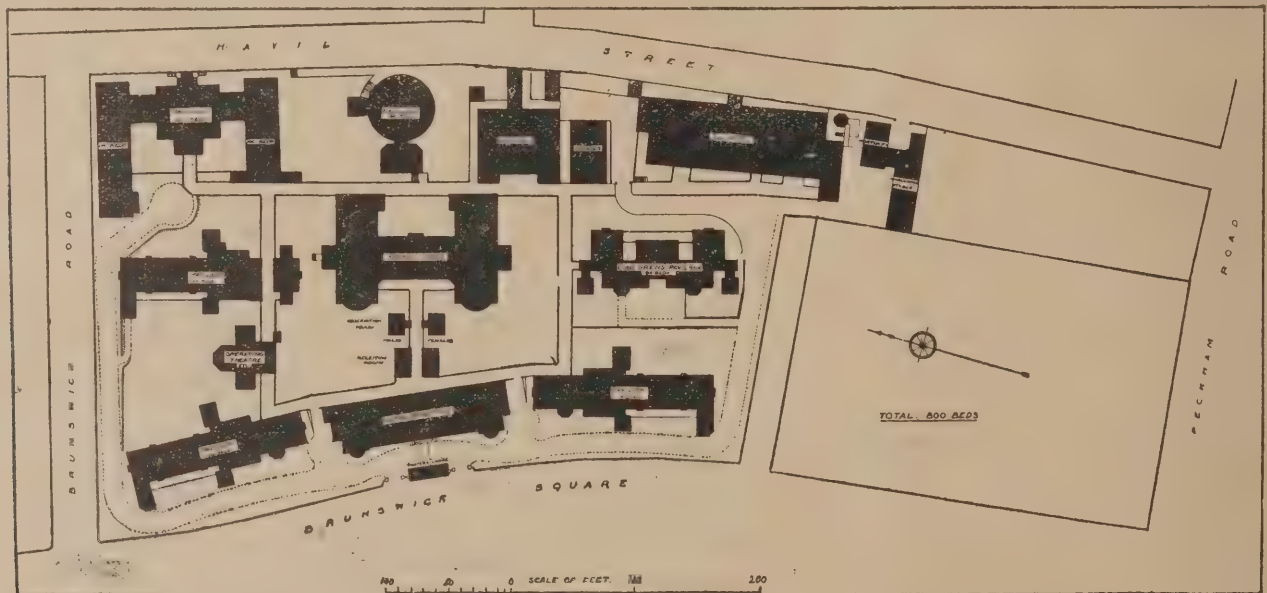
Mr. George Hall, partner in the firm of Messrs. John Hall, builders, contractors and owners of extensive stone quarries, Gorses Quarry, Bury, died recently.

Mr. Samuel Thomas Watton, senior partner of the firm of Messrs. T. Watton & Sons, builders, Tamworth, which was established by his grandfather over a century ago, died recently.

Re W. Antill & Co.—Last week E. A. Young, one of the partners in the firm of W. Antill & Co., builders, of Mornington Crescent, N.W., who failed in August last, was granted his free discharge.

Mr. Tyrer Connard, builder, of 125, Hampton Road, Southport, died recently at the age of thirty-one. The late Mr. Tyrer Connard carried on the builder's business of nearly forty years' standing in which he had followed his father, the late Mr. Walter Connard, and which has been associated with the erection of many important buildings in the town.

Mr. A. Hughes, an official of the Wirral District Council, has been appointed chief buildings



NEW INFIRMARY, BRUNSWICK SQUARE, CAMBERWELL, S.E. EDWIN T. HALL, F.R.I.B.A., ARCHITECT.

no new work should be placed with the Department. He was opposed to placing the work under the Architect and Engineer, as some members proposed, because the appointment of a manager was the only check over the Works Department. In the last five years the Department had carried out £700,000 worth of work for the Housing Committee, and the excess over the measured value and the detailed prices of the officers was no less than £65,000. But the officers' prices were based on the fact that there would be a profit to the contractor, so that not only did they lose the theoretical profit, but they lost £65,000 which was irrecoverable. On the other hand, contractors had carried out £187,000 worth of work for the same Committee, and the saving on the officers' estimates, based on the quantities and detailed measurements, was over £15,000. He considered they had enough experience now to make it perfectly clear that the contract system was the best. He was convinced that a gigantic labour bureau controlled by a municipality was impossible.

Mr. Beachcroft, in seconding the amendment, said the reason that the Works Department had failed was that there was lacking the incentive of gain.

Lord Welby said that, taking the works begun, carried out and completed by the Works Department under the present management in the last four and a half years, they found that estimated works of the value of £466,000 were done at a cost of £473,000, which was an excess

on February 18th, the president, Mr. H. G. Luff, A.R.I.B.A., of Devonport, being in the chair, a lecture on "Bacteria in relation to Sanitation" was delivered by Dr. Ransome Pickard. After dealing with the classification of forms and reproduction of bacteria, the lecturer proceeded to describe their functions in the process of decomposition, especially with regard to the microbic action in the purification of sewage as brought into play by the septic tank treatment. Important points with regard to hospital construction were traversed, attention being drawn to the production of spores and the difficulty of dealing with them and of destroying some of the bacilli with ordinary means of disinfectants, and the precautions adopted in the modern operating theatres to guard against infection. Ventilation was discussed and the problem of sanatoria, which is being increasingly forced upon the attention of the public and the medical profession at large, who however were not quite decided as to the question of the best sites. In the discussion that followed the president referred to the provision of plate-glass linings to the walls of operating theatres. Mr. Jerman mentioned that in some recent reports at Leeds, &c., it was stated that the closed tank was unnecessary for the sewage purification, which was equally well dealt with by direct application to the filter beds. Dr. Pickard in reply said he was of opinion that the breaking down of the organic matter would proceed more rapidly and effectively in the closed tanks. Further dis-

inspector to the Manchester Corporation. The vacancy was caused by the appointment of its former holder, Mr. W. Wilson, as chief inspector of dangerous buildings.

Scaffolding under the Workmen's Compensation Act.—A slater's labourer named Marshall, whilst carrying slates up a ladder at Scarborough, fell and fractured his skull and thigh, and his leg had afterwards to be amputated. The judge disallowed the claim for compensation. The applicant was going up a ladder with slates, and a man on the roof, doing repairs, was working without a platform, plank or ladder. His Honour could not, therefore, say the building was being repaired by means of scaffolding.

The Dundee Building Trade is at present experiencing a period of acute depression. Partially owing to general stagnation in the property market, and in a greater degree because of the recent severity of the weather, building operations in all branches have been practically at a standstill, and many tradesmen in consequence find themselves out of employment. Masons in many instances have been idle for three months, while slaters and others engaged in allied trades are in a somewhat similar position. It is the joinery trade, however, that has felt the pinch most acutely.

The Yorkshire Master-Painters' Federation held its annual meeting recently at Bradford. The principal business was the election of officers for the ensuing year, which resulted as follows:—

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, February 26th, 1902.



Jenkesbury.

Drawn by SIDNEY R. JONES.

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ARTHUR C. BLOMP



NEW INFIRMARY, BRUNSWICK SQUARE, CAM



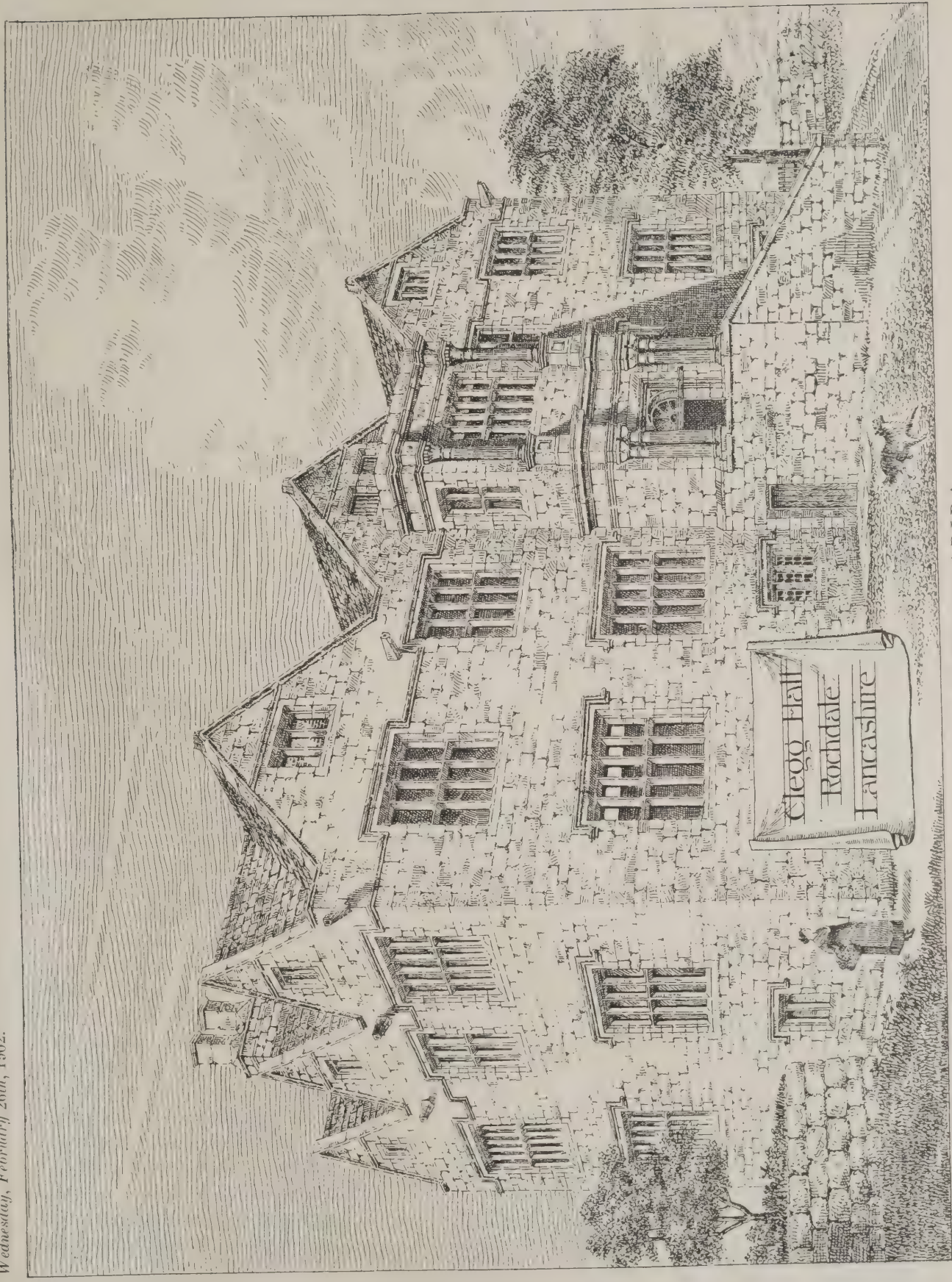
, F.R.I.B.A., Architect.



"INK-PHOTO" R. J. EVERETT & SONS. FOREST HILL, S.E.

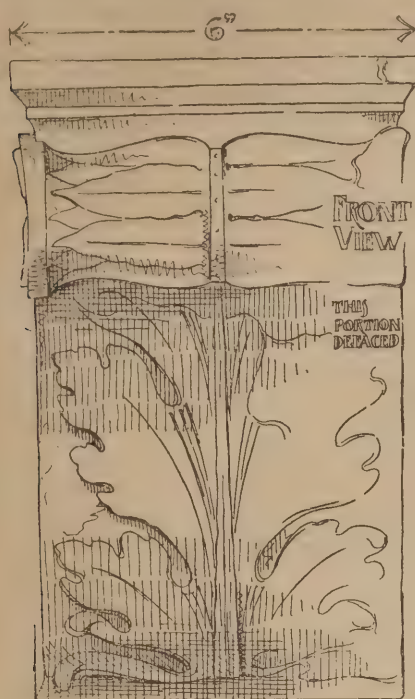
RWELL, S.E. EDWIN T. HALL, F.R.I.B.A., Architect.

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Drawn by W. EATON, A.R.I.B.A.

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BRACKET
IN CARVED ISTRIAN STONE
ITALIAN (VENETIAN)
OF ABOUT 1490

quarter supplied to a customer in any one establishment.

Institution of Mechanical Engineers.—The fifty-fifth annual general meeting of this Institution was held last week, the president (Mr. W. H. Maw) occupying the chair. The annual report stated that at the end of 1901 the membership was 3,491, compared with 3,165 at the end of the previous year. The progress which had been made by the Institution since its establishment in the new quarters at Storey's Gate had been in every way most satisfactory. The total revenue for the year was £9,306 and the expenditure £9,115. Mr. Maw was re-elected president.

Italian Renaissance Brackets.—The two brackets illustrated on this page belong to the "early" period of the style. The design of the Venetian example is very suggestive of that city's intimate association with the sea, and the other is not less interesting as a treatment of sculptured ornament on constructive lines. The stone is dark grey in colour, apparently limestone. Both brackets are in the Victoria and Albert Museum, South Kensington. The drawings are by Mr. F. R. Hiorns, A.R.I.B.A.

President, Mr. F. J. Pickersgill, Leeds; vice-president, Mr. W. Garside, Leeds; hon. secretary, Mr. J. Tetley, Huddersfield; hon. treasurer, Mr. G. Spencer, Bradford. The headquarters of the federation during the year will be in Leeds. In connection with the apprentices' prize competition Mr. J. Harland, of Bradford, promised a gold medal as an extra prize for next year, and a promise of a silver medal was made by Mr. W. Simpson, of Hull.

Engineering Notes.

Mr. J. D. Cormack, B.Sc., Professor of Mechanical Engineering at University College, has accepted the position of Honorary Consulting Engineer to University College Hospital.

Second Assistant Engineer, Metropolitan Asylums Board.—Applications for this appointment must reach the clerk at the offices of the Board, The Embankment, not later than March 3rd.

Accepted Tender for Widening London Bridge.—The Court of Common Council last week accepted the tender of Messrs. Pethick Brothers, of Plymouth, for widening London Bridge, subject to certain conditions, at a cost of £95,484 12s. Further sums of £700 and £1,000 were also voted to repair the carriageways of London Bridge and Blackfriars Bridge respectively.

Ventilation of Factories and Workshops.—The Home Secretary has issued an order prescribing that the ventilation of every textile factory in which atmospheric humidity is artificially produced by steaming or other mechanical appliances, and in which special rules or regulations with respect to humidity are not for the time being in force, shall be such as to supply during working hours not less than 600 cub. ft. of fresh air per hour for each person employed.

Municipal Electrical Supply in Liverpool.—The report of the Liverpool City Electrical Engineer (Mr. A. B. Holmes) to the members of the Corporation supplies some remarkable figures in regard to the rapid development of the municipal electrical enterprise in that city, the aggregate output of the past year being no less than 20,018,166 units, which Mr. Holmes believes to be greater than that of any other electrical undertaking in the United Kingdom. Of this total 6,235,658 units were for lighting and power and 13,782,508 for tramways. In 1898 the total was 2,915,695 units, in the following year 5,729,477 units, and in 1900 11,564,335 units. Mr. Holmes deals only with the electrical work, but mentions that more than 380 electric tramcars are now running in the city. Electrical energy for lighting and power is

supplied throughout the city at a pressure of 230 volts. Over a considerable area the supply is on the three-wire system, which affords for large motors a supply from the outer conductors at a pressure of 460 volts. The pressure of the tramway supply is 500 volts, and each of the steam dynamos in the new stations can be used for either service. This enables each set of plant to be run approximately the same number of hours per annum, the "stand by" plant being reduced to a minimum. With this arrangement it has been possible to generate electrical energy in the form in which it is distributed and used—that is as "direct" current at a pressure of 460 to 500 volts. This avoids the necessity for capital expenditure on transforming apparatus and also prevents working losses incidental to transformation. The Electrical Power and Lighting Committee, on Mr. Holmes's recommendation, have decided to reduce the charge for electrical energy from 4d. to 3d. per unit for any energy in excess of 3,000 units per



BRACKET
IN CARVED PETRA LUTETIA
ITALIAN, OF
ABOUT 1430

Views & Reviews.

A New Dictionary of Architecture.

From its very nature a dictionary of architecture is sure to meet with a great demand, for the only other similar dictionary in English is that eight-volume one begun about 1850 and finished ten years ago. Of glossaries there is a goodly supply, but a cheap and compendious dictionary has been badly needed. Dictionaries there are, of course, in foreign tongues, but the difficulty of consulting them is considerable. Encyclopædias or cyclopædias do not possess the essential feature of a dictionary—the alphabetical arrangement in detail.

This dictionary, however, is doubly welcome, for not only does it supply a need, but does so most admirably. Dictionaries cannot be expected to be complete when first in the field; they must grow gradually, and the first labour is immense. Thus, Mr. Russell Sturgis has had little to guide him or to refer to in compiling this work. He has had the co-operation of many experts, however, and though the definitions seem somewhat personal and contentious from the want of crystallization that comes from general acceptance, this is somewhat compensated for by the additional interest this provokes, so that the book becomes a real pleasure to read consecutively and not only useful for consultation.

The illustrations have met with adverse criticism, but it seems to us that sufficient consideration has not been given to the difficulty of obtaining artistic drawings, and the very great expense that would be entailed in having them redrawn; and, after all, these serve their purpose in nearly every case, being clearly explanatory.

In order to facilitate reference, a dictionary must combine the two features of alphabetical arrangement carried to minute subdivision, with cross-references in abundance; but one of the greatest advantages of this work is that it enables one, by consulting one term, to find its related words or the terms of its subdivisions. Thus, in the matter of Columnar Architecture it is sometimes desirable to find out quickly the proper term for the colonnade of seven columns, but no dictionary gives this unless elaborated as we have said; Sturgis's dictionary, being so elaborated, does so.

There is one criticism that must be made against the work, and that is, there is no proportion preserved between the information afforded in the definitions. Some of the definitions are extended to such length as to be more in the nature of articles in an encyclopædia, whereas other constructional terms are given the barest explanations, hardly fuller than would be found in a general dictionary. The definitions of materials and workmanship are extremely bald in the majority of cases, whereas decorative works and motives are dealt with at great length. This want of proportion is a relic of the misunderstanding of the essential elements of architecture which has been general for so many years, and of course we have so much more information available on the decorative side than on the constructive.

In Vol. I, Prof. W. R. Lethaby contributes a most interesting and suggestive article on design, in which he takes the evolutionary view which has been somewhat ambiguously spoken of as "functional" or "organic." In dealing with the subject of proportion, however, he inclines to the opinion that the only rule is fitness. But there is something more than this; there is the same harmony which is the essence of music, poetry and painting. The word "proportion" has been wrongly used, but with all the mistakes of ancient writers they understood this element of architecture. Mr. Lethaby sees this, only he chooses to deal with it under the headings—symmetry, order and unity. He says, "The general law in regard to these considerations is the desirability of order, which itself is based on convenience and on ideas derived from the harmony in nature's order." It is all very well also to refer to the "sweetening" of the lines in Greek architecture, but this is only naming the result or means, not the cause or reason.

"A Dictionary of Architecture and Building: Biographical, Historical and Descriptive." Edited by Russell Sturgis, A.M., Ph.D. In three volumes, price 25s. each, nett. London: Macmillan & Co., Ltd.

Who Built the Pantheon?

The object of the author of this little book is to prove that the portico and the rotunda of the Pantheon at Rome were not both built by Agrippa in B.C. 27, but that the Romano-Greek *pronaos*, which bears the inscription of Agrippa, was part of a temple destroyed and replaced by the present circular building with its 28ft. opening in the dome 140ft. above the pavement. Fergusson said he felt convinced that the rotunda was much more modern than the portico and that it seemed more reasonable to ascribe its construction under the Tarquins than during the reign of Augustus. Our author says: "In every case, setting aside the Pantheon, the *cella* attached to the portico is quadrilateral; there is no instance of the combination of a Greco-Roman facade with a cylindrical drum": and he adds that neither of the cornices of the drum is coincident in height from the ground with that of the portico, an inconsistency which no designer of the two portions could have deliberately created. Pliny, Dion Cassius and other writers are referred to, but they furnish nothing absolutely conclusive, and we are left in the end with an unproved case: though it seems feasible the author's contention is correct, that the rotunda was first built in the days of Septimius Severus, more than two centuries after Agrippa's death.

"The Pantheon at Rome: Who Built It?", by James Thomas. London: Swan Sonnenschein & Co., Ltd., Paternoster Square, price 2s. 6d.

The Perplexing Act.

To make it at all comprehensible, the Workmen's Compensation Act has needed to be bolstered by innumerable law decisions, annotated and explained in numerous books; and even now there are many points about it which are obscure and difficult to define. This book sets forth concisely the scope of the Act as determined by recent legislation and as extended by the amendments introduced by the Factory and Workshop Act, 1901. It is pointed out under the heading of "Building exceeding 30ft. in Height, &c.," that in the latest case on the subject one of two adjoining houses was being demolished, and at the time of the accident was only 11ft. high, but as the party wall, which exceeded 30ft. in height, was left standing it was held that there was evidence to justify a finding that the house was over 30ft. high. It should also be noted that a building is "being constructed" until all the scaffolding used for the purpose of construction has been taken down; and also that the term "scaffolding" is not confined to what is generally known as such, but applies to internal scaffolding as well, including also an internal staging of planks and trestles, without poles: in fact, as the author observes, it is doubtful whether a ladder may not be "scaffolding" if used to stand on for executing repairs. Another point to note is that if a building exceeding 30ft. in height is being constructed or repaired with the aid of scaffolding, not only those actually engaged on the scaffold but all the workmen employed on or about the building come within the scope of the Act. This book explains all these and other matters in a brief and lucid manner.

"Outline of the Law relating to Workmen's Compensation," by William Bowstead, barrister-at-law. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 4, Stationers' Hall Court, price 1s.

A Pocket-book of Architecture.

Some men have found it difficult to write a history of architecture in several large volumes. Mr. P. L. Waterhouse does it in a book small enough to be easily slipped into the pocket. The book is of the same series as "The Story of King Alfred," "The Story of Euclid" and "The Story of Fish Life," and it is a pity that it was not enclosed between a more attractive cover, for at first sight it reminds one of the nursery. However, on turning the pages it will be found that the author has done his task very admirably. It is difficult to trace the development of architecture in 200 small pages, illustrated here and there with tiny cuts: and Mr. Waterhouse has done wisely to append a selected list of books for those who would further study the subject. We think however he might, even with the limits imposed on him, have given a little more space to modern architecture, as six pages can hardly be called sufficient for dealing

with the whole of the nineteenth century, especially when two pages of these are occupied by the sky-scraper: Romanesque architecture gets nineteen pages, Gothic thirty-eight and Renaissance thirty-six. The book is of course intended for popular consumption and as such it suits its purpose admirably. Considering that it can be obtained for ninepence nett, it is remarkably cheap.

"The Story of Architecture," by P. Leslie Waterhouse, M.A., A.R.I.B.A. London: George Newnes, Ltd., price 1s.

Velazquez.

Within the last few years a great deal has been written of Velazquez, and the exhibition of his wonderful pictures has made them familiar to the public as well as to the connoisseur. In this monograph, which should find a ready sale, technical criticism has been eliminated as much as possible, the author's object being to present a faithful history of the life and works of Spain's greatest artist, and to give some idea of his personality, and of the strange world by which he was surrounded; a number of half-tone reproductions of the artist's most important pictures serving to illustrate the letterpress. The bibliography at the end of the book and the list of those in possession of Velazquez's works are both interesting and valuable.

"Velazquez: His Life and Works," by Hugh Stokes. London: The Art Record Press, 144, Fleet Street, price 1s. nett.

The Newest Architecture.

In "The Artist" for February, which is a most interesting number, Mr. Harry S. Curry discusses the architectural and decorative details of the "new style" evolved during the last few years. The first is a very tall attenuated pilaster or pillar which can be of 1 or 100 diameters, or more if required; and next comes the very flat moulded cap which "forms, crowns, stamps, seals, consecrates, and alone, of and by itself, constitutes the architectural order of this supreme modern art." This is the W.D.P. ("well deserving pillar") of universal distribution. Thirdly, we come to the form of arch used, "simple but graceful in outline," and fourthly we arrive at that very important element in the new art—the teasing-fork, or T.F. For any scheme the T.F. symbol is indispensable and must be completely mastered "in all the serpentine sinuosities of each individual tail ere any attempt be made to design." Mr. Curry illustrates many forms of it, such as the flower T.F., the hinge T.F., the Noah's Ark tree T.F., or the candelabra T.F. Usually it has flowers or buds "growing on the prongs, with a leaf or two on the stem." Other details of the style are perforated hearts, and panels with inscriptions ("The Panels are Coming"); the latter however are not carved but ornamented with hammered copper-work or gesso. As to furniture, this is of plain or green-stained oak with copper fittings, or the most effective and latest use of metals, rusty steel. The W.D.P. is often introduced, being made taller and taller still, with a candle-socket on the top, or a rusty steel lamp having very thick, green, streaky glass. The influence of the style on the exterior architecture is very marked. Long, high, sloping buttresses are placed "at such odd corners and angles as are best calculated pleasantly to surprise the spectator"; the windows are long and narrow and are so arranged "that you cannot see out with comfort either standing or sitting"; the chimneys are about twice as large "as would besem any ordinary house to entertain, and on the front and back should be fixed large wrought-iron Ss"; while the roof should be large enough for the upper storey to disappear into it and be lighted by quaint dormer windows. Finally, the house is painted white all over, with the exception of the roof, which is tiled, and the shutters, which are painted a grass-green colour and perforated with hearts in the centre.

Mr. Curry's article is illustrated by a number of amusing sketches.

"The Artist." London: 27, Chancery Lane, price 1s.

A Leeds Competition.—Mr. John Lane Fox, architect, of Bond Street, Dewsbury, and 28 East Parade, Leeds, has been successful in winning the premium of £30 offered by the Leeds Corporation for the best design of public baths to be erected at Bramley. Mr. Leonard Stokes, F.R.I.B.A., of London, was the assessor.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Books on the Cross.

SUNDERLAND writes: "Is there any book published dealing with the 'Cross,' showing its development and symbolic meanings, &c., in the Latin, Greek, Celtic and other styles?"

The only two books on the subject are "Cruciana: Illustrations of the most striking aspects of the Cross of Christ," with cuts, 8vo, 1855, scarce (to be obtained for 9s. 6d. from Mr. B. T. Batsford, 94, High Holborn), and Tijaet's "Cross in Ritual Archaeology and Art" (Batsford, 3s. nett).

The Institute of Patent Agents.

LONDON.—AN OLD READER FROM ABROAD writes: "How can I become a Fellow of the Institute of Patent Agents or a Chartered Patent Agent (are these two names used for the same body)? I am going abroad, and I am told that it would be to my advantage, as a member of the architectural profession, to become a member of the Chartered Patent Agents."

We fail to see how becoming a Fellow of the Chartered Institute of Patent Agents can be of use to an architect going abroad, but, for your information, we may state the following particulars. The examinations conducted or recognised by the Institute are for (a) the registration of patent agents, and (b) the admission of Fellows, Associates and Students. Twelve examinations held under various bodies—such as matriculation at any of our universities, first-class College of Preceptors, or Associate, King's College—are recognised as preliminary examinations, the full list of which can be obtained by applying to the secretary of the Institute at 19, Southampton Buildings, Chancery Lane, W.C. Once a year (generally in November) a Final Qualifying Examination is held for enrolment on the Register of Patent Agents (the candidate must have been for at least seven consecutive years in a registered patent agent's office, or be a solicitor, or have passed one of the above-mentioned preliminary examinations). This final examination qualifies as Fellow, while Associateship is also secured by it, subject to the candidate having passed satisfactorily in certain subjects. The entrance fee is one guinea.

Mastic Joint between W.C. Pan and Soil Pipe.

SALOP.—J. J. writes: "Kindly describe a mastic joint to w.c. pan and lead soil pipe where an S. trap is used?"

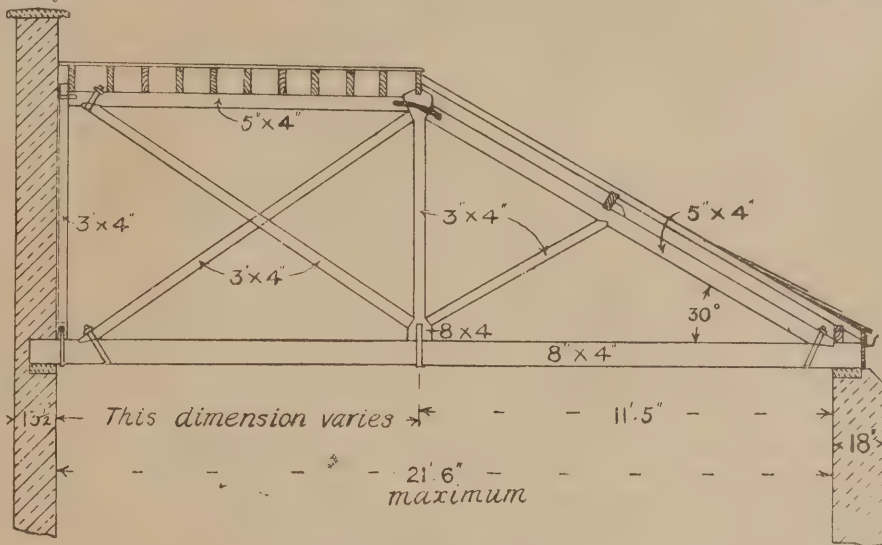
There are several preparations in the market for making a mastic joint between an earthenware w.c. basin and the lead trap, so that the actual details connected with making the joint vary according to the character of the material used. Messrs. Dent & Hellyer, Newcastle Street, Strand, W.C., supply an "elastic cement" at 1s. per tin for bedding the basin of their wash-down closet upon a lead-trap pedestal. The directions given for making the joint are as follows:—"Make a grummet (or ring) of hemp, soak it in hot 'elastic cement' and place it around the outlet of the basin against the projecting bead formed there to retain it in its position. Warm the lead seating and bottom of basin, spread some warm 'elastic cement' over each, place the basin in the seating, and, whilst continuing to warm the basin and seating, work the basin down carefully until firmly bedded and quite level. Care should be taken that the grummet placed around the outlet of the basin does not allow any of the cement between the basin and the seating to ooze into the trap." It should be borne in mind that a mastic joint is not suitable for making a direct connection between a lead soil-pipe and an earthenware closet-trap. A joint of this description should be made by means of a brass thimble or socket soldered to the soil-pipe, the outlet of the earthenware trap being then

inserted into the brass socket, and the joint carefully made good with neat Portland cement. T. E. C.

Roofing over Yard.

M. S. T. M. writes: "The accompanying plan (not reproduced) shows a piece of land which it is proposed to roof over for use as a cart shed. Kindly give the class of roof and columns necessary, together with full details of construction. The 18in. stone wall must be kept down to one level; its present height from the surface of the ground is 8ft. 3in. The portion of the shed from A to B has to remain open, the roof to be supported on cast-iron columns. The 1½ brick wall may be finished off on the slope and built to any height as required. The height from the surface of the ground (which may be taken as level) to the underside of the tie-beam or lowest part of the roof truss to be 8ft."

It is not the purpose of these enquiry columns to give full working drawings in any case, but merely to give assistance in general principles or upon points of detail. Competent architects can always be found in the neighbourhood who will be willing, for a reasonable fee, to supply suitable designs or working drawings. In the present case a length of 127ft. 3in., with a width of 22ft. 10in. for about half the length, reducing suddenly to 21ft. 6in. in the middle and tapering gradually to 13ft. at the other end, is to be roofed



ROOF FOR CART SHED.

over for a cart shed, a length of 60ft, on one side being supported upon cast-iron columns. For this latter part six cast-iron columns may be provided, 10ft. centre to centre, carrying King-post roof-trusses. The height being 8ft., the columns should be solid cast-iron of 3in. diameter, or hollow columns 6in. diameter and ½ in. thickness of metal, with proper caps and base-plates. They should be connected together at the top by a timber beam not less than 8 by 8, or two 9 by 3 bolted together, or by a 5 by 4½ by 19lb. rolled steel joist. For the other part of the roof the straight side may match the part already described with the ridge continuous, the taper side being brought in by shortening the trusses on that side and letting the slates form a "flew" surface, i.e., with a gradually increasing pitch. Or, if the wall on the taper side may be carried up above the level of ridge, the trusses may be as sketched with a lead flat on the side with variable width.

HENRY ADAMS.

Rendering Sewage Land less Odorous.

GUILDFORD.—W. E. writes: "(1) I have a set of house drains with flushing tanks, all sewage going into a large cesspool, thence pumped into a tank, and gravitating over the land. The smell however is sometimes very bad. Is there any chemical I could use to diminish this? (2) I now use green copperas in the flushing tanks. Can you explain what effect this has, and if there is anything better?"

(1) The "Oxygen Sewage Purification Co's." system (address, 1, Suffolk Street, Dublin) might be advantageously adopted under such circum-

stances. In this system a proprietary preparation known as "Oxynite" is used for the chemical purification of the sewage. The "Reeves" system (Reeves Chemical Sanitation, Ltd., 17, Victoria Street, Westminster, S.W.) is another well-known method of sewage deodorization and purification by chemical means. The agents employed are "Reevozone" and sulphuric acid. (2) Green copperas (protosulphate of iron, $\text{FeSO}_4 + 7\text{H}_2\text{O}$), like sulphate of copper ($\text{CuSO}_4 + 5\text{H}_2\text{O}$), permanganate of potassium (KMnO_4) and other substances of a similar nature, which contain a considerable amount of oxygen, are largely used for the deodorization of sewage, owing to the fact that they readily give up their oxygen in the presence of organic matter. There are several deodorants much more powerful than green copperas—such as potassium permanganate with sulphuric acid—but some of the best known are proprietary articles specially prepared for sewage purification. The degree of deodorization effected by chemical means generally resolves itself into a question of expense. A considerable amount of valuable information respecting the chemical purification of sewage will be found in "Specification" No. 5, published at these offices, price 5s. nett. T. E. C.

Work of Assistant Town Surveyor.

ENQUIRER writes: "Kindly give me an idea of what would be the work of an assistant to a

town surveyor, both in the office and outside. What book would you recommend for study by one who is thinking of securing such a post?"

Get "How to become a Municipal Engineer," by J. Freebairn Stow, published by the St. Bride's Press, Ltd., 24, Bride Lane, Fleet Street, E.C., price 1s. A good handbook to study is Boulnois's "Municipal and Sanitary Engineer's Handbook" (E. & F. N. Spon, Ltd., 15s.), and "Specification No. 5" is an excellent reference book.

Books on Stresses, Strains, and Strength of Materials.

SCARBOROUGH.—ENQUIRER writes: "What books on stresses, strains and strength of materials do you recommend for the R.I.B.A. Intermediate Examination?"

Sir J. Anderson's "Strength of Materials" (3s. 6d.), Unwin's "Testing of Materials of Construction" (Longmans, Green & Co.).

South African Appointments.

CARDIFF.—BRITISHER writes: "I propose going to South Africa, either to Natal or Cape Colony. Are there any Government positions being given out to building foremen or inspectors?"

The railways are the only Government work on which, so far as we know, a building foreman might find employment in Cape Colony. In Natal employment under Government is obtained in the same way as here, but there is a plentiful supply of labour. See p. 391 of our issue for January 15th last.

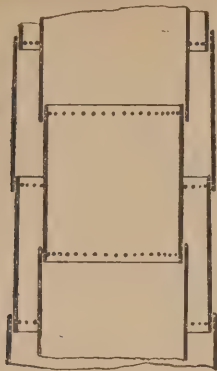


FIG. 1

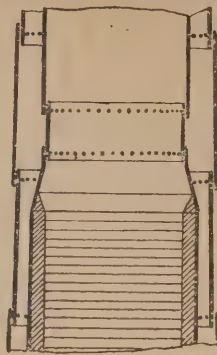


FIG. 2.

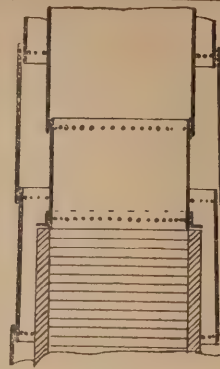


FIG. 3.

CONSTRUCTING STEEL CHIMNEY.

Stability of Steel Chimney.

BRISTOL.—E. E. M. writes: "I have to design a steel chimney stack 90ft. high and of about 4ft. internal diameter at the top and 7ft. at the bottom. How can I ascertain the strength and stability of such a structure?"

The main principles to keep in view are the following:—The maximum wind-pressure may be taken at $\frac{1}{2}$ cwt. per sq. ft. super. The effect of the wind on a circular chimney as compared with a square chimney or a plane surface is .7854 to 1. The internal diameter of a chimney shaft should be uniform; this can best be secured by a lining which has only its own weight to carry. Mild steel weighs 490lbs. per cu. ft. A height of 90ft. with uniform thickness and diameter would bring a pressure of $490 \times 90 = 306$ lbs. per sq. in. on the bottom, add

144
10 per cent. for rivets and laps = 337 lbs. per sq. in. for any thickness, but mild steel can safely be loaded to $6 \times 2210 = 13,440$ lbs. per sq. in., so that while $\frac{1}{2}$ in. is the thinnest practical lining it leaves a large margin for corrosion. The formula for contents of the frustum of a cone is $\frac{1}{3} \pi h (D^2 + d^2 + Dd)$. The outer shell may be perhaps $\frac{1}{2}$ in. thick at the bottom and $\frac{3}{8}$ in. at the top. With a bottom diameter of 7ft. inside and a top diameter of 4ft. inside, the weight of material would be $\frac{1}{3} \pi \times 90 (7^2 + 4^2 + 7 \times 4) = 2256.2 - 2191.26 = \text{say } 65$. $65 \times 490 = 31,850$ lbs. Add 5 per cent. for rivet heads = 33,442.5 lbs., and 2 cwt. for cap = say 33,670 lbs. This will give a pressure per sq. ft. at bottom of $\frac{33,670}{33.67} = \text{say } 30,404$ lbs. or $\frac{30,404}{2240} = 13,573$ tons. Now we must find the extra load brought on by the wind. The formula for a combined vertical and lateral force is $P = p + M \frac{I}{y}$, where—

P = maximum pressure tons per sq. ft. for both loads.
 p = average pressure tons per sq. ft. for vertical load only.
 M = bending moment in ft.-tons due to wind pressure.
 I = moment of inertia of section in ft.
 y = distance in ft. from neutral axis to furthest edge of section.

From above $p = 13,573$ tons per sq. ft. The bending moment will be $M = wL$. $w = \frac{4.06 + 7.1}{2} \times 90 \times .7854 \times \frac{1}{20} = 9.86$, say 10 tons, which will be applied at the centre of gravity of the diametrical plane, say 4ft. up = L . Then $M = wL = 10 \times 41 = 410$ ft.-tons. The moment of inertia of an annular section = $\frac{\pi}{64} (D^4 - d^4) = \frac{3.1416}{64} (7^4 - 4^4) = 6.872$, and $y = 3.55$. So that $p + M \frac{I}{y} = 13,573 + 410 \frac{6.872}{3.55} = 793$ tons per sq. ft., or $\frac{793}{144} = \text{say } 5.5$ tons per sq. in.

which fortunately will be just about the right load to allow a margin for corrosion. The accompanying sketches show alternative methods for dealing with the lining. Fig. 1 shows $\frac{1}{2}$ in. inner cylinder from top to bottom. Fig. 2 shows $\frac{1}{2}$ in. cylinder 9in. larger lined with firebrick half-

way up and a taper length above to reduce to normal size. Fig. 3 shows $\frac{1}{2}$ in. cylinder standing on a firebrick wall 9in. thick at the bottom for 20ft. up reduced by a set-off on the outside to $\frac{1}{2}$ in. thick for the upper part. Unless a steel chimney is in a very sheltered position it should have at least three guys to hold it in case of unnoticed corrosion at base, and these should make an angle of not more than 60 degs. with the horizontal.

HENRY ADAMS.

Books on Specifications, Quantities and Surveying.

FAVERSHAM.—G. I. J. writes: "Please name a good book on specifications, quantities and estimates, and surveying and levelling."

Specification: No. 5" (published from these offices, price 5s. nett), "Quantities and Quantity Taking," by W. E. Davis (D. Fourdrinier, Catherine Street, Covent Garden, W.C.; price 3s. 6d.), "Estimating," by George Stephenson (B. T. Batsford, price 6s. 6d.), "Practical Surveying," by G. W. Usill (Crosby Lockwood & Son, price 7s. 6d.).

Requirements of S. K. Building Construction Examination.

NORTH SHIELDS.—RHADAMANTHUS writes: "What are the requirements of the South Kensington Advanced Building Construction examination?"

See p. 93 of our issue for September 18th last.

Ascertaining Cost of Building.

ILKLEY.—R. F. writes: "Kindly answer the following question set at the R.I.B.A. Final Examination:—Three methods for arriving at the approximate cost of a building with the cost per cu. ft. for ordinary brickwork, stone, dressed stone, &c."

See an article on "The Cost of Buildings" on p. 408 of our issue for August 22nd, 1900.

Tile Manufacturers.

BRISTOL.—M. writes: "What is the address of J. & J. Wade, enamelled tile manufacturers?" We do not know.

Books on Building Construction.

LONDON.—H. T. S. writes: "Kindly recommend a book on Building Construction suitable for a pupil. I do not want an advanced or expensive work."

Read our articles on Building Construction. The best book on the subject is Rivington's, and if you intend seriously to study building construction you must get it. You need not obtain all the volumes at once, but get the next after you have read through each. There are four volumes: Vols. I. and II. 10s. 6d. each, Vol. III. 21s., Vol. IV. 15s. They are published by Longmans, Green & Co. Allen's "Practical Building Construction" (Crosby Lockwood & Son, price 7s. 6d.) is a good book for a beginner.

Builder's Liability for Mistakes in Quantities.

IPSWICH.—W. H. D. writes: "Referring to the reply on p. 451 of your issue for February 12th, suppose the architect omitted a large quantity of, say, brickwork, which was shown on the plans. The loss would be the builder's, although he has no means of checking the quantities. We often estimate for work without ever seeing the plans, or, at most, we just see them for half an hour in the architect's office. If your answer is right we shall have to check every bill of quantities."

The bill of quantities forms no part of the contract, and it is generally understood that the builder uses it at his own risk. He most certainly should check the bill of quantities with the specifications and drawings unless he can trust to the quantity surveyor's competency.

New Patents.

These patents are open to opposition until March 29th.

1901.—Sewage Distributing Apparatus.—1,070, W. D. SCOTT-MONCRIEFF, 14, Victoria Street, Westminster, S.W. The apparatus consists of a revolving horizontal distributor divided into lengths having a separate adjustable supply, so as to suit the area over which the section discharges; moreover the distributing pipe is perforated and has a trough on its upper side, into which liquid can well up and overflow. The whole is carried on girders and revolves on a vertical axis working in a gland and stuffing-box through which the incoming sewage is delivered.

Water-Closets.—4,537. W. DUNBAR, Newton Chambers, Cannon Street, Birmingham, and J. K. and W. FORD, both of Osmaston, Derby. A valve closet and an auxiliary syphon flushing cistern are placed side by side, the latter being emptied immediately after the contents of the former have been discharged into the trap: both being operated by pulling the valve-closet handle. The advantages claimed are that the action is very free from noise and the flush from the cistern, being concentrated directly on the comparatively small water-surface of the trap, effectually clears the latter and washes the drain.

Ventilators for Sewers.—4,742. T. E. BLADON, 99, Northwood Street, Birmingham. The ventilator consists of a many-sided body fitted with specially-hung mica or aluminium flaps and set on the top of a shaft: the object being to allow wind to enter whatever its direction may be.

Pug-Mills.—5,758. A. DISS, 21, Stanwell Street, Colchester. To the outlet of the pug-mill is attached a cast-iron grid having wedge-shaped bars presenting their sharp edges inwards. This grid prevents the clay leaving the mill too quickly and ensures thorough amalgamation; also preventing the exit of stones or lumps.

Roofing Materials.—24,139. J. SCHECK, Villa Stella, Kilchberg, near Zürich, Switzerland. The material consists of asphalt, cement, tarred paper, &c., made into sheet form with an inner layer of wire-cloth or perforated sheet metal.

The following specifications were published on Thursday last, and are open to opposition until April 5th. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1901.—1,976, FRANKLIN, figured, rolled and other glass. 2,203, CHALLENGER, window-blind brackets. 2,557, ISAAC, apparatus for automatically ringing any number of electric bells. 3,123, SEGUY, insulating conduit for electric tramways. 4,959, MATHIESON, DENDY & MATHIESON, flue-pipe hood for ranges. 5,045, BOUQUET, pipes of strengthened cement, concrete, &c. 5,759, DISS, device for laying damp-courses. 5,760, DISS, metal dowel or tenon. 6,325, SHUMAN & SHUMAN, machines for moulding glass, &c. 6,384, LOGAN, street or road water-carts. 6,587, ECKSTEIN & COATES, water-tight electric bells. 6,836, HOWELL, forming screw-tapped lugs on letter-box plates, door knockers, &c. 7,108, J. & M. CRAIG, LTD., and HIGHT, after-service devices for syphonic water-closets. 16,665, ORR & MCCULLOCH, updraught ventilating cowls. 20,364, PELSENSTEIN, plural fuse-cut-outs for electric circuits. 21,546, MILLS (International Chemical Co.), composition for use as painters' filling. 22,782, JONES & JONES, locks. 23,438, BRENNER, door jams, gate posts, &c. 23,443, VON FORELL, manufacture of cement. 24,285, STEWART, expansion sockets for soil, waste, ventilating and other lead pipes. 24,423, WAINWRIGHT (Reno Inclined Elevator Co.), inclined elevators. 26,339, ROOPER, artificial grindstones. 26,524, THOMPSON (Davis), laying of underground electric conductors.

Keystones.

Richmond Hill View.—The Court of Common Council have refused to make a grant towards the preservation of this view.

"A Fireproof Railway Station."—The whole of the glasswork and roofing of this station, which was described on p. 7 of last week's issue, was executed by Messrs. Mellows & Co., Eclipse Works, Sheffield.

A New Wholesale Market at Leicester has been erected by the Corporation at a cost of more than £60,000. The building was designed by Mr. Brand in the Elizabethan style. The front is mostly faced with terra-cotta.

The Design for Hull's City Hall.—At a meeting of the Coltman and Albert Wards Ratepayers' Association held last week at Hull a resolution was passed approving the architect's design for the new city hall and shops, with the exception of the windows at the east end, and urging the Council to proceed with the work as soon as possible.

Glasgow and the Housing Problem.—The Glasgow Corporation agreed last week to seek Parliamentary powers to borrow three-quarters of a million sterling in order to acquire fifty acres within the City boundary upon which to erect dwellings for the poorer classes. It is proposed to build 400 tenements three storeys high, each tenement to have nine houses, thus giving in all 3,600 houses.

Westwood Edge Mission Church, Huddersfield.—A new chancel and Dorcas-room has been built in the Gothic style at a cost of about £840. The chancel has been furnished with oak furniture, and there are two leaded lights. The following were the contractors:—Messrs. Hirst, Frith & Co., masons, Golcar; John Varley & Sons, joiners, Slaithwaite; Frank Goodall, plumber and glazier, Slaithwaite; James Walker, plasterer and painter, Slaithwaite; and Thomas Allison, slater, Milnsbridge.

St. Matthew's Church, Grange-town, has just been completed. It is built entirely of brick, with the exception of the pillars and the arches in the arcades and the panel over the principal entrance, which are of stone. It is designed in the Early English style, with lancet windows and pointed arches. The cost of the building when completed will be about £5,000. Mr. G. M. Radge, of Normanby, is the builder, and Messrs. Hicks & Charlewood, of Newcastle, are the architects.

The Old Parish Church of Lydiard Tregoze, so intimately associated with the Bolingbroke family, has recently been restored and renovated, it is gratifying to learn, in a thoroughly conservative spirit. The main building dates from the early part of the fifteenth century, but there are traces of Norman work, especially a fine arch at the north door. In removing much modern plaster and whitewash a number of interesting frescoes were discovered, some being remarkably well preserved. Over the chancel arch is a picture of the Crucifixion with many figures, and on one of the nave pillars a painting of Christ after the Resurrection. Elsewhere are representations of St. Michael and the Dragon and a Norman castle. The removal of the plaster from the roof disclosed the fine old oak timbers in good preservation. At the northern entrance are carved figures representing Christ crowned with thorns and the Blessed Virgin.

A Batley Sunday School.—The Hanover Street Congregational Sunday School, Batley, is to be extended in the direction of the market estate, and more largely towards Hanover Street, where an imposing entrance will be erected in the Gothic style, in keeping with the other appointments. This enlargement will find additional accommodation for 150 more scholars in the assembly-room. Besides, the scheme includes two entrance-halls, a lecture-hall, young ladies' classroom, young men's classroom, library and other rooms. Messrs. C. H. Morriott, Son & Shaw, architects, of Dewsbury, have prepared the plans. The contractors are:—Mason, Mr. Joseph Oldroyd, Batley; joiner, Mr. W. H. Clegg, Dewsbury; slater, Mr. W. H. Thompson, Batley; plumber, Mr. James Walshaw, Batley; plasterer, Mr. Samuel Crawshaw, Batley; and ironwork, Messrs. James Bagshaw & Sons, Batley. The estimated cost is £2,842.

New Club Premises at Hull have been erected for the Hull and East Riding Club from plans by Mr. B. S. Jacobs at a cost of about £10,000.

Newmarket Architect's Affairs.—At the Cambridge Bankruptcy Court last week H. W. Roberts, of Kingston House, Newmarket, architect, came up for his public examination. The statement of accounts showed a deficiency of £1,307 19s. 3d.

A Reunion of London Scottish Architectural Assistants.—The Scottish architectural assistants resident in London held a dinner on Friday evening at the "Florence," Mr. James S. Gibson, F.R.I.B.A., occupying the chair. The company numbered about fifty. After the dinner a very successful smoking concert was held.

New Bank at Chelmsford.—Plans for the new building of the Capital and Counties Bank, Ltd., in the High Street, Chelmsford, have just been completed by Messrs. Clare & Ross. Five storeys high, the lower storey will be of finely-dressed grey granite, with a polished Hoptonwood stone plinth, while the upper storeys will be of red brick with Ancaster stone dressings.

Board School Buildings at Birkenhead.—At the last meeting of the Birkenhead School Board the plans of Mr. Thomas W. Cubbon, architect, of Birkenhead, were adopted for a block of educational buildings, including a pupil teachers' college and two higher elementary schools for 300 boys and 300 girls respectively. The pupil teachers' college has accommodation for 150 students. The whole block of buildings is expected to cost about £30,000.

Mr. Charles Henry Hargreaves, architect, of Bradford, died recently in the sixtieth year of his age. Mr. Hargreaves, was articled with the late Mr. Eli Milnes, and started in practice for himself as an architect thirty-four years ago. He made a special study of the designing of elementary schools, and for twenty-six years he was with Mr. E. P. Peterson, F.S.A., joint architect to the Bradford School Board. For a period he was in partnership with Mr. Wilson Bailey, of Bradford and Keighley.

New Baptist Schools at East Finchley N., are being erected at a cost of about £3,700 from designs by Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, architects, 5 Clement's Inn, Strand, London. The school hall will be of two storeys, with classrooms under the side end galleries, divided by swivel panelled partitions, and a spacious platform. Three large classrooms are arranged in the rear at one end of the hall. The buildings are to be faced with split flints and Bath-stone dressings. A spacious church for 760 sittings with a bold tower is part of the scheme, but will not be erected for the present.

Edinburgh Architectural Association.—At last week's meeting of this Association (Mr. H. F. Kerr, president, in the chair) a lecture was delivered by Mr. W. G. Burn-Murdoch on Scottish history from early times to the Union of Scotland and England. Limelight views were shown of the historical design proposed for the new municipal buildings in Edinburgh. Previous to the lecture, on the motion of the chairman it was remitted to the committee of management to consider and report as to the desirableness of affiliation with the Royal Institute of British Architects. Mr. James Bruce, W.S., gave notice of the following motion: "That the Association should approach the Carnegie Trust with a view to establishing a Chair of Architecture in the University of Edinburgh."

Iona Cathedral is to be restored. The choir, the aisles and the south transept are to be roofed in. Possibly the finishing of the top of the tower and roofing it according to its original height may be included in the work, but this is not quite decided on. The roof will be in strict accordance with the original roof; the gables of the building are still standing, and the raggle of the tower will clearly indicate the form and height of the original wall. All the indications of this kind presented by the building will be rigorously adhered to. The windows are to be glazed, and the portion taken in hand will be rendered perfectly water-tight. The remaining part of the restoration will go on as funds permit. The architects are Messrs. McGibbon & Ross, Edinburgh; and Messrs. Mitchell & Sons, Edinburgh, are the contractors.

Science, not Sentiment, says Mr. Balfour, is required for the solution of the housing problem.

For Striking Matches on a Building, and so defacing it, a man was fined 10s. at Evesham recently.

The Distillery in Cowcross Street, E.C., illustrated on p. 2 of our last issue, was designed by Mr. E. W. Mountford, F.R.I.B.A., not by Mr. Colcutt.

"The Art Record."—The February issue of this publication, which is now a monthly, contains reproductions of numerous studies by Mr. Herbert J. Draper, whose work attracts so much attention at the Academy exhibitions.

The Glasgow Technical College Architectural Craftsmen's Society held a meeting last Friday, when Mr. Thomas S. Fraser, architect, read a paper on "The Renaissance Architecture of Scotland."

A Dartmouth Competition.—Mr. A. S. Parker, of Plymouth, has won the first premium in the competition for offices and a dwelling-house for the Channel Coaling Co., at Dartmouth. Mr. J. J. Smith, of Bidford, and Mr. P. Kerley, of Exeter, were awarded the second and third premiums respectively.

Partnership.—Mr. J. F. Fogerty, B.E., A.R.I.B.A., and W. Clifford Parnell, architects, civil engineers and surveyors, have entered into partnership, thus combining the businesses of the late firms of Pinder & Fogerty (formerly Kemp Welch & Pinder) and Pearce & Parnell (formerly Pearce & Offer). Their address is Belfast House, Gervis Place, Bournemouth.

A New Police Station and Library at Chapeltown is to be erected for the Leeds City Council from designs by Mr. William H. Thorp, architect, of 61, Albion Street, Leeds, at the junction of Chapeltown Road and Town Street. The Elizabethan style of architecture has been adopted. It is estimated that the total expenditure upon the building will be a little over £8,000. A fire-brigade station is included in the design.

A Birmingham Architect's Bankruptcy.—The first meeting of creditors of Herbert J. Greatrex, architect, 121, Colmore Row, Birmingham, was held last week. The debtor's statement of affairs showed unsecured liabilities £806 7s. 10d. and assets estimated to produce £339 5s. 6d. Failure is attributed to "law charges, borrowing money at a heavy rate of interest, and illness."

Prizes for Good Street Architecture.—Following the example of Brussels, the Paris Municipality resolved a couple of years ago to give prizes every year for the six handsomest new houses. The prizes were to consist of gold medals to the architects, bronze medals to the builders, while the landlords were to be exempted from half the taxes falling upon a new building. A jury of architects has published its list of awards, and appends a critical notice of the six prize buildings.

The South Wales and Monmouthshire Architects' Society held its annual meeting recently at the Art Galleries, Queen Street, Cardiff. Mr. E. W. M. Corbett, J.P., presiding. The following officers were elected for the ensuing year: President, Mr. H. Snell; hon. secretary, Mr. C. L. Wilson; hon. treasurer, Mr. E. H. Faulkner; hon. librarian, Mr. H. C. Rimell; hon. auditor, Mr. E. H. Bruton; council, Messrs. H. Snell, E. W. M. Corbett, George Thomas, J. C. Carter, E. B. Dowler, E. H. Bruton, E. M. Bruce-Vaughan, E. H. Faulkner, W. H. D. Caple, E. H. Down, and C. L. Wilson.

Mr. Norman Shaw's Studios.—The late Mr. Sidney Cooper's London house and studio are to be sold by auction next month. The studio of the Chepstow Villas house was designed by Mr. Norman Shaw, R.A., who has been responsible for the plans of a great number of the houses and work-rooms of his painter-brethren. Mr. Norman Shaw designed two of the finest of the Melbury Road houses, those of Mr. Luke Fildes and Mr. Marcus Stone, and the quaint and charming house that Mr. Boughton built for himself on the summit of Campden Hill twenty-three years ago. Among the Hampstead artist houses designed by Mr. Norman Shaw those built for the late Frank Holl and for Kate Greenaway are pre-eminent. It was Mr. Shaw, too, who designed the fine painting-room that Mr. B. W. Leader built at Gomshall.

Trade and Craft.

Church Fittings.

Messrs. G. Porter & Co., church furnishers, send us a copy of their illustrated catalogue of the various fittings or furniture for churches. A large variety of pulpits, altars, fonts, reredoses and choir stalls (in oak, pitch-pine, Caen stone and marble) are shown, and chancel and parclose screens, lecterns, church seats, &c., are dealt with in an equally comprehensive manner: so that all needs, from plain pitch-pine work to elaborately-carved furniture, are satisfied. In addition, Messrs. Porter also supply brass altar crosses, candlesticks, thuribles, vases and other accessories of religious worship, besides church decorations of every kind. The firm also undertakes monumental sculpture and are willing to forward special designs for tombs, crosses, &c., on application. Their showrooms are at 260, Fulham Road, West Brompton, and their works at 402-4, King's Road, Chelsea, London, S.W.

Grundy's Patent Closet.

The efficiency of closets is only second in importance to the purity of our water-supply, and it is satisfactory to know that they are being increasingly made more sanitary. The type to which we now wish to draw attention—"The Only"—is supplied by Grundy's Sanitary Appliances Syndicate, of 13, King William Street, London, E.C. In designing this closet the special features kept in view were efficiency, durability, silence and simplicity. Ball, ball-tap, chains, syphon and other accessories are all dispensed with, and instead a two-way valve is employed which is operated by the seat or a foot-lever at one side. When pressure is applied to either of these the valve spindle is raised and allows the cistern to fill, the discharge of the water being effected when the pressure on the seat or the foot-lever is relieved. The only water-pressure required is the head sufficient to fill the tank to provide a flush equal to the present open-tank system. No sound of running water can be heard when the tank is filling and, further, in the supply pipe in front of the inlet valve is placed a check valve, which is always closed except when the tank is filling, thus preventing the supply being contaminated with foul gas or other impurity: while to prevent the tank emptying sluggishly a balance valve is fixed at the top to accelerate the flush. Another speciality of Grundy's Sanitary Appliances Syndicate is a non-ball-valve storage cistern for water. Its main features are that water cannot be wasted from the overflow (this being prevented by a float) and cannot re-enter the main (this being effected by the non-return valve). The cistern is filled from the top and emptied from the bottom, all offensive house smells and dust are guarded against, while pure air from outside is admitted as required. The cisterns are made to withstand any pressure from 10lbs. to 200lbs. per sq. in. and of 20 gals. to 200 gals. capacity. It may be added that this system of storage has already been approved by several water companies.

New Companies.

R. Canty & Sons, Ltd.

Registered to carry on business as wholesale and retail timber merchants, sawmillers, wood-turners, japanners and builders' merchants. Capital £6,000 in £1 shares. The directors are R. Canty, sen., R. Canty, jun., A. Canty and E. W. Nelson. Registered office: Dawson Lane, Kingston-on-Hull.

Adderley Park Brick Co., Ltd.

Registered to acquire the business now and hitherto carried on under the style of the Adderley Park Brick Company (in liquidation) with the factories and other property connected therewith, and to carry on business as manufacturers of and dealers in bricks, tiles, drain-pipes and other articles of clay; as builders and contractors, merchants and dealers in stone, sand, lime, bricks, timber and hardware. Capital £12,000 in £5 shares. The first directors are James Moffat, T. Hunt, T. Surman and J. J. Moffat.

COMING EVENTS.

Wednesday, February 26.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. G. Burn-Murdoch on "Historical Design proposed for the New Municipal Buildings," 8 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I).—Mr. A. Wellesley Harris, M.B.O.S., on "Infectious Diseases," 7 p.m. Inspection and Demonstration at Soap Works.
NORTHERN ARCHITECTURAL ASSOCIATION.—Council Meeting at 6.45 p.m. Mr. Algernon P. B. Barker, B.A., on "Duties of Building Owners as to Sewers," 7.30 p.m.
DEVON AND EXETER ARCHITECTURAL SOCIETY (Plymouth, Devonport and Stonehouse Branch).—Address by Mr. Silvanus Trevall, F.R.I.B.A., P.S.A.
GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, February 27.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.
LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Paper by Mr. William Burton, F.C.S., 6.30 p.m.
ROYAL ACADEMY.—Mr. Alfred Gilbert, R.A., on "Sculpture"—IV., 4 p.m.
CARPENTERS' COMPANY, Carpenters' Hall, E.C.—Mr. H. Heathcote Statham, F.R.I.B.A., on "The Architectural Treatment of Bridges," 8 p.m.

Friday, February 28.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. T. H. Russell, M.A., on "Dartmoor Granite," 7.30 p.m.
DEVON AND EXETER ARCHITECTURAL SOCIETY.—Mr. A. S. Parker, A.R.I.B.A., on "Building By-laws."
PHYSICAL SOCIETY.—Meeting at 5 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I).—Mr. A. Wellesley Harris, M.B.O.S., on "Methods of Disinfection," 7 p.m.
INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. A. M. Arter on "Indicating High-Speed Steam Engines," 8 p.m.

Saturday, March 1.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at 6 p.m.
SANITARY INSPECTORS' ASSOCIATION.—Meeting at 6 p.m.
ROYAL INSTITUTION.—Lord Rayleigh on "Some Electrical Developments"—II., 3 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at Marylebone Stoneyard, Richmond Street, Edgware Road, W., at 3 p.m.

Monday, March 3.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Special General Meeting to elect Royal Gold Medalist. Ordinary General Meeting following. Sir W. B. Richmond, K.O.B., R.A., to move: "That in view of a resolution of the Coal Smoke Abatement Society seeking the co-operation of the Institute, members are invited to join the Society, or that such assistance be given by the Institute as the Council may deem desirable." Exhibition of about a hundred photographs of architectural work, forming part of the collections of the National Photographic Record Society prior to the collections being deposited in the British Museum.
ROYAL ACADEMY.—Mr. Alfred Gilbert, R.A., on "Sculpture"—V., 4 p.m.
BIRMINGHAM AND DISTRICT CLERKS OF WORKS' AND BUILDERS' FOREMEN'S ASSOCIATION.—Mr. Joseph H. Pickard on "The Highways and Byways of Warwickshire," 8 p.m.
ROYAL PHILOSOPHICAL SOCIETY OF GLASGOW: ARCHITECTURAL SECTION.—Mr. Joseph Sommerville on "The Habitat and Mode of Growth of the Dry Rot Fungus."

LIVERPOOL ARCHITECTURAL SOCIETY.—Paper by Mr. Edgar Wood, A.R.I.B.A.
VICTORIA INSTITUTE.—Mr. J. Malcolm Mac'aren on "The Physical History of the New Zealand Fjords," 4.30 p.m.
SOCIETY OF ENGINEERS.—Mr. Benjamin H. Thwaite, A.M.I.C.E., on "British versus American Patent Law Practice and Engineering Invention," 7.30 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Demonstration of Book-keeping as carried out in a Sanitary Inspector's Office, in the Parkes Museum at 7 p.m.; by Mr. Albert Taylor.

Tuesday, March 4.

ROYAL INSTITUTION.—Mr. W. N. Shaw on "The Temperature of the Atmosphere"—II., 3 p.m.
ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. F. G. Hicks on "Colour in Architecture," 7.45 p.m.
SOCIETY OF ARTS (Applied Art Section).—Mr. Gerald C. Horsley on "Structural Colour Decoration of the Interior of Public Buildings," 8 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. Henry R. Kenwood, M.B., on "Water: Composition, Pollution and Purification," 7 p.m.

Wednesday, March 5.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.
EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Meeting).—Mr. George Wittet on "A Visit to Oxford," 8 p.m.
THE CHEMICAL SOCIETY.—Meeting at 5.30 p.m.
BRITISH ARCHAEOLOGICAL ASSOCIATION.—Meeting at 8 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and demonstration at L.C.C. Common Lodging House, Parker Street, Drury Lane, W.C., at 3 p.m.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BOX (WILTS).—For alterations to Sunnyside, for Mr. D. G. Bingham. Mr. Harold Brakspear, F.S.A., architect, 31, Chancery Lane, Messrs. Pinks & Watson, Parliament Mansions, Victoria Street, S.W.1.—
Light & Smith ... £2,000
R. E. D. Rudman ... 2,570
Hayward & Wooster ... 2,543
H. Hoskings, Hungerford ... 2,490
* Accepted.

BRADFORD (WILTS).—For the erection of new stable buildings at the Hall, for Mr. J. Moulton. Mr. Harold Brakspear, F.S.A., architect, Corsham. Quantities by Messrs. Pinks & Watson, Parliament Mansions, Victoria Street, S.W.1.—
R. E. D. Rudman ... £2,127
E. Chancellor ... 2,120
Hayward & Wooster, Bath ... 2,080
* Accepted.

DEVIZES.—For alterations to Brownston House, for the Misses Milnes. Mr. Harold Brakspear, F.S.A., architect, Corsham. Quantities by Messrs. Pinks & Watson, Parliament Mansions, Victoria Street, S.W.1.—
Hayward & Wooster ... £2,636
Light & Smith ... 2,318
H. Hoskings ... 2,150
R. Rudman, Chippenham ... 2,187
* Accepted.

DYSART.—Accepted for the formation of a sewer on Dysart Road, for Dysart Town Council. Mr. D. Forbes Smith, A.R.I.B.A., surveyor, 210 High Street, Kirkcaldy.—
Alexander Fraser, Junr., Perth ... £240 6 10

GWYRFAL (WALES).—For the construction of tanks, flushing chambers, and for providing and laying about 3,340 lineal yards of 4-in. and 21 lineal yards of 3-in. cast-iron main and other works, for the Gwyrfal Rural District Council. Mr. E. Evans, A.M.I.C.E., engineer, & Castle Street, Carnarvon.—
D. Owen, Glyn Garth Post Office, Menai ... £3,671 14 6
W. Thomas, Tregeath, Bangor ... 2,935 0 0
E. Jones, Plas Dowllydd, Llanwnda ... 2,550 0 0
R. Jones, Twrog Mills, Llanwnda ... 2,564 3 5
E. A. Chase, Moultpier, Bristol ... 2,496 12 3
M. A. Crowe, Deansgate, Manchester ... 2,289 16 4

GELLIGAER (WALES).—For the following works: (Contract No. 1.) Bargoed and Giffach sewerage—the laying of 8½ miles of 12-in. sewers 12 in. to 6 in. in diameter, together with manholes, ventilators, bacteria beds, screening chamber, detritus tank, storm-water filter, flushing tank, &c.; (2.) Fochriw sewerage—the laying of 1,340 yards of pipe sewers 9-in. and 9-in. diameter, together with manholes, ventilators, bacteria beds, screening chamber, &c., for the Gelligiger and Rhigos Rural District Council. Mr. Jas. P. Jones, engineer.—

Bargoed and Giffach sewerage.
W. Williams, Ystrad Rhondda ... £10,531 19 8
J. Sutherland, Clifton Villa, Abercynon ... 10,316 12 2
D. Jones, Dowlais ... 9,760 10 9
W. Williams & Sons, New Tredegar ... 9,198 8 10
G. Rutter, Romilly Chambers, Barry ... 8,963 6 1
J. E. Evans, Taverne, Cardiff ... 8,583 12 5

Fochriw sewerage.
G. Rutter ... £1,172 13 0
Lawson & Co., Newport ... 1,143 14 10
J. E. Evans ... 1,105 16 8
D. Jones, Brithdir ... 1,069 0 0
D. Jones ... 958 7 0
W. Williams & Sons ... 931 14 8
J. Jones, Graigfaerod, Beddington ... 901 4 11
F. Davies & Co., High Street, Bargoed ... 861 1 6
* Accepted.

HATFIELD.—For the erection of new infirmary for women at the workhouse, for the Guardians. Messrs. Chas. Smith & Son, architects, Reading.—

Stephens, Bastow & Co., Ltd. ... £2,801 0 0
Perry Bros. ... 2,650 0 0
C. Jackson ... 2,620 1 6
J. Appleby ... 2,584 0 0
General Builders, Ltd. ... 2,513 4 3
Coulson and Lotts ... 2,415 0 0
S. Redhouse, sen. ... 2,377 4 9
W. M. Ruther ... 2,372 16 4
W. Howard ... 2,345 15 0
Miskin & Sons ... 2,343 0 0
W. French ... 2,313 4 3
Dupont & Co. ... 2,275 0 0
Wilmott & Sons ... 2,255 0 0
Hardy Bros. ... 2,252 0 0
Viney & Stone ... 2,214 0 0
F. G. Minter ... 2,207 0 0
Maple & Co. ... 2,187 0 0
Norris & Son ... 2,180 0 0
Mussellwhite & Son ... 2,177 0 0
G. Jackson ... 2,167 0 0
T. H. Coleman ... 2,135 0 0
W. Wade ... 2,130 0 0
Ekins & Co. ... 2,103 0 0
Wilkinson Bros. ... 2,066 0 0
W. G. Durham ... 2,060 10 0
S. Warboys, Potters Bar, Middlesex ... 2,060 0 0
* Accepted.

HAVERHILL (SUFFOLK).—For the erection of a house, offices, and stores in High Street, Haverhill, for Messrs. Green, King & Sons, Ltd., Bury St. Edmunds. Mr. A. Ainsworth Hunt, architect, Sudbury.—

Coulson & Lotts, Cambridge ... £2,083
Kerridge & Shaw, Cambridge ... 1,900
C. Runnacles, Halstead ... 1,897
Mason & Sons, Haverhill ... 1,783
* Accepted.

JARROW.—For excavating and making the following streets and roads: St. Paul's Road, Russell Street, Wilberforce Street, and Raglan Street, for the Urban Sanitary Authority. Mr. J. Petree, borough surveyor.—

Thornton ... £2,120 7 0
T. Callagher ... 1,961 1 3
Glen & Moffat ... 1,926 1 5
* Accepted. [Surveyor's estimate, £1,770 12 6.]

KIRKCALDY.—Accepted for the erection of houses in St. Clair Street, Kirkcaldy, for Messrs. Henry and Peter Kilgour. Mr. D. Forbes Smith, A.R.I.B.A., architect, 210 High Street, Kirkcaldy.—

Mason—Henry Masterton, Kirkcaldy ... £728 14 8
Joiners—Geo. Hay & Son, Dysart ... 492 12 0
Plasterers—J. Williamson & Son, Burntisland ... 144 11 6
Slaters— ... 69 5 0
Plumbers—Blyth & Doregal, Kirkcaldy ... 74 10 0
[Total £1,560 13s. 8d.]

LONDON, E.—For the erection of new offices and caretaker's lodge, 3 Mill Lane, Bromley-by-Bow, E., for Messrs. Kemball, Bishop & Co., Ltd. Messrs. Wigg, Oliver, Hudson & Co., architects, 80 Leman Street, E. Quantities by Messrs. Stranger & Son:—
G. E. Weston ... £2,472
J. & H. Cocks ... 2,462
Hawley & Newman ... 2,346
Hawley & Oldman ... 2,320
Cuthwaite & Co. ... 2,267
Sparks ... 2,250
Shurnur & Co. ... 1,965
Shorn & Sons ... 1,950

LONDON, W.—For the erection of villa residence in Hendon Avenue on the Great Park Estate, for Messrs. J. J. Bridgewater. Mr. Walter Bennett, architect, Church End, Finchley, N. Quantities by Mr. William Hawker, 73 Moorgate Street, E.C.4.—
Fremman & Barber ... £3,500
Jesse Phoenix ... 2,900
Gough & Co. ... 2,934
[Architect's Estimate £2,800.]

LONDON, N.—For new block of workmen's dwellings in Northwood Road, Stoke Newington. Mr. R. Langton Cole, architect:—
Dore Bros. ... £6,855
Woodward & Co. ... 6,840
Lawrance & Co. ... 6,005
Coils & Sons ... £6,647
Clarke & Bracey ... 6,305
* Accepted.

LONDON, N.W.—For retaining wall to house, Frogdon Lane, Hendon, and Messrs. Barrett & Driver, architects, 53 Blomfield Road, Maida Vale, W.1.—
John Russell, Hampstead ... £2,825
G. Neal, Kilburn ... 263
* Recommended for acceptance.

LONDON, S.E.—For adapting 288 New Cross Road for use as a postmen's sorting office, for the Commissioners of H.M. Works and Public Buildings:—

	A.	B.
S. J. Collins	£2,515 11 7	£15 4 6
J. Mowlem & Co.	1,143 0 0	—
Courtenay & Fairbairn	1,079 0 0	—
T. & W. Pearce	1,000 0 0	10 0 0
J. Christie	1,010 0 0	10 0 0
T. G. Minter	1,010 0 0	10 0 0
Multon & Wallis	1,800 0 0	18 0 0
General Builders, Ltd.	1,821 0 0	25 0 0
H. L. Holloway	1,815 0 0	15 0 0
Wilson Bros. & Lamplough	1,789 0 0	11 0 0
W. Wallace & Co., Ltd.	1,775 0 0	12 0 0
Speckley & Smith	1,760 0 0	—
J. Appleby	1,770 0 0	—
H. Leney & Son	1,750 0 0	5 10 0
G. Barker	1,750 0 0	6 0 0
T. O. Sharlington	1,748 0 0	10 0 0
V. Westbrook	1,742 0 0	21 0 0
Bayley, Sons & Holmes	1,726 0 0	3 0 0
Turnbull & Son	1,717 0 0	10 0 0
T. Almond & Son	1,683 0 0	2 0 0
J. O. Richardson	1,679 0 0	5 0 0
G. Conn & Son	1,590 0 0	40 0 0

* Accepted. [A. Old materials.]

LONDON, S.W.—For the erection of a new police court at Westminster, for the Metropolitan Police. Mr. J. Dixon Butler, police surveyor:—

	Credit.
Poster & Dicksee	£16,692
Lascelles & Co.	11,900
Wilmott & Sons	11,000
Lathey Bros.	10,000
Leslie & Co.	13,900
H. Lovatt	13,650
Snark, Patrick & Son	13,490
Higgs & Hill	12,984
Holloway Bros.	12,650
T. Parker	12,885
Grover & Sons	12,705
H. J. Williams	12,500
Lawrence & Sons	12,390
C. Ansell	12,311
Ashby & Horner	12,000
F. & F. H. Higgs	11,973

LONDON, W.—For a new shop window to No. 11 Westbourne Grove and alterations to No. 5 to 17 Westbourne Grove, for Mr. Henry Dobb. Messrs. Barrett & Driver, architects, 53, Blomfield Road, Maida Vale, London, W.1.—
W. H. Lascelles ... £284
S. Haskins & Bros. ... £422
Drew & Co. ... 406
Cadman & Sons ... 415
Fredck. Sage & Co. ... 450
* Recommended for acceptance.

LONDON, S.W.—For the erection of two shops and premises on the site of 379 Balham High Road, for Mr. H. W. Nightingale. Mr. Horace E. Rossiter, architect, 61 and 62 Chancery Lane, London, W.C.1.—

	A.	B.
F. & F. H. Higgs	£2,740	£18
J. Carnichael	2,588	20
J. A. Bartram	2,538	48
Lathey Bros.	2,537	25
Garrett & Son	2,450	36
W. Lorden & Son	2,392	23
E. Briggs	2,210	23
H. Line	2,136	30

[A. Stonework in Portland. B. Saving if Bath stone used.]
* Accepted (using Bath stone) at £2,106.

LONDON, W.—For making and sewerage, including branch drains, Temple and Weston Roads, on the Kingswood Park Estate, Acton Green. Mr. Edward Monson, F.R.I.B.A., architect and surveyor, Acton Vale, W., and 22 Buckingham Street, Adelphi, W.C.1.—

	A.	B.
Meston & Hale, Harlesden, N.W.	£2,002	—
Kavanagh & Co., Surbiton Hill, Surrey	1,881	—
T. Adams, Great Eastern Railway, Wood Green	1,835	—
Felkin & Watson, Southall	1,702	—
Killingback & Co., Camden Town, N.W.	1,702	—
C. Ford, Harlesden, N.W.	1,680	—
H. Morecroft, Acton Green, W.	1,678	—
Carpenter & Willis, Clapham, S.W.	1,665	—
Nowell & Co., Kensington, W.	1,636	—
Wimpey & Co., Hammersmith, W.	1,625	—
F. Smith, Adelphi, W.C.1.	1,598	—
J. Macklin, Hanwell, W.	1,550	—
H. Boyer, Paddington Basin, W.	1,532	—
R. Clarke, East Croydon	1,430	—
R. W. Swaker, Whitton, Hounslow	1,330	—
W. H. Wheeler, Blackfriars Road, S.E.	1,307	—
A. C. Soan, Streatham	1,280	—
Woodham & Sons, Catford, S.E.	1,245	—

* Accepted.

MANSFIELD.—For forming and making roadways and footpaths, sewerage, kerbing, and channelling new streets over land belonging to Messrs. J. J. and A. S. Ward, Ratcliffe Gate, Mansfield. Messrs. Vallance & Westwick, surveyors, White Hart Chambers, Mansfield.—

C. E. Cox & Son, Gregory Street, Ilkeston	£1,573 13 6
S. Richmond, Nottingham	1,500 0 0
A. B. Clark, Wright Street, Nottingham	1,500 0 0
T. B. Penny, Station Road, Ilkeston	1,453 7 4
G. F. Tomlinson, Derby	1,390 0 0
H. Ashley	1,320 0 0
H. Bennett, Bowling Street	1,214 1 1
J. Greenwood	1,161 11 0
Lane Bros., Corporation Street	1,118 10 0
A. F. Houghton, Leeming Street	1,074 0 0

* Accepted. [Rest of Mansfield.]

MARKET HARBOUROUGH.—For (Contract No. 2) supply and erection of about 189 tons of cast-iron posts, and about 77 tons of wrought-iron rails and gates, for the cattle, sheep, calf, and pig pens in the new cattle market, for the Market Harborough Urban District Council. Mr. Herbert G. Coles, A.M.I.C.E., architect.—

G. Harvey & Co., Chapel Town	£4,084 19 0
J. Williamson & Co., Wellingborough	4,076 9 6
Naylor Bros., Ltd., Golborne	4,389 7 0
Cort, Paul & Cornick, Leicester	4,080 8 3
Gimson & Co., Leicester	4,063 8 8
W. Richards & Sons, Leicester	3,861 3 1
W. A. Baker & Co., Newport	3,876 5 6
H. E. Hodgson & Co., Cleckheaton	3,850 0 0
G. B. Smith & Co., Glasgow	3,700 1 8
T. Howden & Sons, Ltd., Wakefield	3,619 15 11
W. T. & Co., Oxford	3,529 1 0
W. Miller & Sons, Wolverhampton	3,465 7 10
W. H. Smith, Whitechapel	3,378 11 11
H. & G. Measures, Croydon	3,356 12 0
E. J. Raybould & Co., Worlington	3,290 16 2
S. Night, Leicester	3,174 0 0
H. H. & Smith, Brierley Hill	3,117 0 0
J. Elwell, Birmingham	3,063 15 0
E. C. & J. Keay, Ltd., Birmingham	3,080 0 0
G. Potter & Sons, Leicester	3,008 4 8
Francis & Whittington, Leicester	2,951 10 0
James Poultry Co., Leabon	2,774 13 7
Russell & Son, Leicester	2,614 4 1

* Accepted.

TWICKENHAM.—For the following works in connection with the widening, forming, levelling, kerbing, paving, channelling, and making good part of a street known as Cross Deep Road, for the Twickenham Urban District Council. Mr. Fred W. Pearce, surveyor:—

A. C. Soan, Streatham	£3,025 0 0
Free & Sons, Maidenhead	2,465 0 0
Mowlem & Co., Westminster, S.W.	2,483 0 0
Heatham & Co., Streatham Hill	2,419 0 0
R. W. Swaker, Whitton	2,350 19 0
W. H. Wheeler, Blackfriars Road, S.E.	2,340 0 0
S. Kavanagh, Surbiton Hill	2,204 0 0
J. Hall, Chiswick	2,208 1 4
Wimpey & Co., Hammersmith	2,023 0 0
W. Adamson, Kingston	1,932 0 0

* Accepted. [Surveyor's estimate, £2,203.]

WEST HAM.—For the erection of 47 double-tenement houses and 12 single tenement houses for the working classes on the Rotherhithe Estate, High Street, Stratford, for the West Ham Town Council. Mr. John G. Morley, borough engineer, Town Hall, West Ham:—

F. & F. H. Higgs, Station Works, Loughborough Junction, S.E.	£43,800
B. E. Nightingale, Albert Embankment, S.E.	35,301
F. G. Minter, Page Street, Westminster	33,160
Gregar & Son, Jupp Road, Stratford	20,900
H. J. Carter, Grays	28,730
F. Jay, Shakespeare Crescent, East Ham	28,362
Herbert Bros., Stamford Road, East Ham	20,650
A. T. Haines & Co., Manor Road, West Ham	25,170
E. Myall, St. Andrew's Road, Clacton-on-Sea	25,163
G. Wise, works manager, West Ham	25,306

* Accepted.

WISBECH.—Accepted for the erection of a pair of semi-detached villas on the Bowdhorpe Estate, Wisbech, for Mrs. E. M. Beales. Mr. George Thorpe, architect, Wisbech:—
John Wm. Wilkison, Elm, near Wisbech ... £235

CURRENT MARKET PRICES.

FORAGE.			
	£ s. d.	£ s. d.	
Beans	per qr.	1 10 0	—
Clover, best	per load	4 16 0	5 10 0
Hay, best	do.	5 5 0	5 12 6
Sainfoin mixture	do.	4 10 0	5 5 0
Straw	do.	1 8 0	2 0 0

OILS AND PAINTS.			
Castor Oil, French	per cwt.	1 7 0	1 8 7
Colza Oil, English	do.	1 8 3	—
Coppas	per ton	2 0 0	—
Lard Oil	per cwt.	2 9 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4	—
Linseed Oil, barrels	do.	1 12 0	—
Petroleum, American	per gal.	0 0 6	0 0 7
Do. Russian	do.	0 0 5	0 0 6
Pitch	per barrel	0 7 0	—
Shellac, orange	per cwt.	6 1 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt	per cwt.	1 9 6	1 11 0
Tar, Stockholm	per barrel	1 3 6	—
Turpentine	per cwt.	1 10 3	—

METALS.			
Copper, sheet, strong	per ton	71 0 0	—
Iron, Staffs, bar	do.	6 5 0	8 10 0
Do. Galvanised Corru- gated sheet	do.	11 11 0	11 15 0
Lead, pig, Soft Foreign	do.	11 7 6	—
Do. English common brands	do.	12 0 0	12 2 6
Do. sheet, English 3lb per sq. ft. and upwards	do.	13 0 0	—
Do. pipe	do.	13 10 0	—
Nails, cut clasp, 8in. to 6in.	per ton	9 0 0	—
Do. floor brads	do.	8 15 0	—
Steel, Staffs, Girders and Angles	do.	5 15 0	6 5 0
Do. do. Mild bars	do.	6 10 0	7 0 0
Tin, Foreign	do.	117 0 0	117 10 0
Do. English ingots	do.	120 0 0	120 10 0
Zinc, sheets, Silesian	do.	21 0 0	—
Do. do. Vieille Montaigne	do.	21 10 0	—
Do. Spelter	do.	17 15 0	17 17 6

TIMBER.			
SOFT WOODS.			
Fir, Dantzic and Memel ..	per load	2 1 0	—
Pine, Quebec, Yellow ..	per load	4 7 6	6 0 0
Do. Pitch ..	do.	2 9 0	8 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 10
Do. Petersburg ..	per bundled	0 8	—
Deals, Archangel 2nd&1st per P.Std.	13 5 0	22 0 0	—
Do. do. 4th&3rd ..	do.	19 15 0	12 19 0
Do. do. unsorted ..	do.	5 12 6	6 10 0
Do. Riga ..	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow ..	do.	9 0 0	15 0 0
Do. do. 2nd ..	do.	8 0 0	11 10 0
Do. do. White ..	do.	7 5 0	11 10 0
Do. Swedish ..	do.	8 13 0	12 5 0
Do. White Sea ..	do.	10 10 0	11 16 0
Do. Quebec Pine, 1st..	do.	19 10 0	21 5 0
Do. do. 2nd ..	do.	9 0 0	18 10 0
Do. do. 3rd &c. ..	do.	7 0 0	10 10 0
Do. Canadian Spruce, 1st ..	do.	7 10 0	9 5 0
Do. do. 3rd & 2nd ..	do.	7 5 0	9 0 0
Do. New Brunswick..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	5 12 6	10 15 0

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:				
Feb.	27	Tonbridge—Thatched Refreshment Kiosk & Bandstand	Urban District Council	W. L. Bradley, Council's Surveyor, Tonbridge Castle, Kent.
"	27	Maesteg—Additions, &c., to Infants' School	School Board	E. W. Burnett & Son, Architects, Tondur, near Bridgend.
"	27	Blacynllyn, Maesteg—School, &c.	Maesteg School Board	E. W. Burnett & Son, Architects, Tondur, near Bridgend.
"	27	Canterbury—Underground Convenience	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, Canterbury.
"	27	Hastings—Walls, Fencing, &c., at Cemetery	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
"	27	Hornsea, nr. Hull—Steam Roller Shed & Coal Store	Urban District Council	W. E. Warburton, Surveyor, Public Rooms, Hornsea.
"	27	London, N.E.—Cart Shed, Office and Mess-room	Hackney Borough Council	N. Scorgie, Borough Engineer, Town Hall, Hackney.
"	27	Northowram—2 Blocks of Semi-detached Houses	Hackney Borough Council	J. F. Walsh & G. Nicholas, Architects, Museum Chbrs., Halifax.
"	27	London, N.E.—Portland Cement, Lime, &c.	Hackney Borough Council	N. Scorgie, Borough Engineer, Town Hall, Hackney.
"	28	Annitsford, Northumberland—Magazine		L. H. Armour, 16 West Street, Gateshead.
"	28	Ballaghameeban, Ireland—Window, Tiles, at Church	School Board	Rev. P. Brady, P.P. Rossinver, Garrison.
"	28	Clutton, Somerset—School Buildings		W. F. Bird, Architect, Midsomer Norton, Somerset.
"	28	Elgin—Bungalow		O. C. Doig, Architect, Elgin.
"	28	Maryport—Cottage Hospital	County Council	O. Eaglesfield, Architect, Maryport.
"	28	Mountain Ash, Wales—Alterations to Police Station		T. M. Franklen, Clerk, Council Offices, Westgate Street, Cardiff.
"	28	Swanage, Dorset—Cottages	Urban District Council	J. Peacey, Architect, South Walks, Dorchester.
"	28	Weston-super-Mare—Cabinets' Shelter		H. Nettleton, Surveyor, Town Hall, Weston-super-Mare.
"	28	Fandach Heath—Wesleyan Chapel and School		A. Price, Architect, Sandbach.
"	28	Hirst, Ashington—Memorial Drinking Fountain	Presbyterian Church Committee	R. Marshall, Station Road, Hirst, Ashington.
"	28	Lurgan, Ireland—National School	Cornwall County Council	H. Hobart, Architect, Dromore, co. Down.
"	28	Helston—Police Station, &c.		O. Caldwell, Architect, Victoria Square, Penzance.
"	28	Herston, Swansage—Cottages	W. Brown & Sons	J. Peacey, Architect, South Walks, Dorchester.
"	28	Darlington—Machine Shop	Girls' School Governors	W. Brown & Sons, John Street Sawmills, Darlington.
"	28	Sherborne—Hall and Classrooms at School	Corporation	J. Harding & Son, 58 High Street, Salisbury.
"	28	Sheffield—Sheds at Police Station		Central Police Offices, Castle Green, Sheffield.
March	1	Pandy, Wales—Improvements to Cottage	Grammar School Governors	E. Foster, Architect, Bella Vista, Abergavenny.
"	1	Bowes, near Darlington—Classroom	Corporation	Vicarage, Bowes.
"	1	Belfast—Branch Library	Urban District Council	Blackwood & Jury, 41 Donegal Place, Belfast.
"	1	Llangollen—Strengthening Assembly Rooms Building	G. H. Willmot	Surveyor, Council Offices, Llangollen.
"	1	Loughborough, Leics—Theatre	Corporation	Barrowcliff & Allcock, Architects, Mill Street, Loughborough.
"	1	Walsall—Lodge, Out-buildings, &c.	Town Council	Borough Surveyor, Bridge Street, Walsall.
"	1	Windsor—Walls and Fencing	Electricity Committee	Borough Surveyor, Windsor.
"	1	Salford—Bricks, Cement, Mortar, &c.		C. D. Taite, Borough Elec. Engr., Strawberry Rd., Works, Salford.
"	1	Kenn, Yatton—School Classroom		Mr. Taylor, Lower Queen's Road, Clevedon.
"	2	Fenwick-cum-Moss, Doncaster—Boundary Walls, Lych-gate, &c.	Commissioners of H.M. Works, &c.	Rev. F. H. Allen, Vicar, Moss Vicarage, Doncaster.
"	3	Manchester—Custom House		Secretary, H.M. Office of Works, Storey's Gate, S.W.
"	3	Merthyr-Tydfil—Three Shops and Offices	Urban District Council	C. M. Davies, 112 High Street, Merthyr.
"	3	Pontypridd—Isolation Hospital	Town Council	E. Rees, Surveyor, Council Offices, Pontypridd.
"	3	Taunton—Destructor Buildings	Gibbs, Mew & Co.	T. H. Smith, Borough Surveyor, Corporation Street, Taunton.
"	3	Harnham—Cottages, and Rebuilding Inn		J. Harding & Son, Architects, Salisbury.
"	3	Bristol—Bricks, Lime, &c.	Northamptonshire County Council	City Valuer, Council House, Broad Street, Bristol.
"	3	Whitton, Northants—Rebuilding Bridge	Visiting Committee	O. S. Morris, County Surveyor, County Hall, Northampton.
"	3	Brazebridge, nr. Lincoln—Alterations, &c., to Asylum	Corporation	Giles, Gough & Trollope, 28 Craven Street, Charing Cross, W.C.
"	3	Yeovil—Lavatory	Urban District Council	W. K. L. Armytage, Borough Surveyor, Municipal Offices, Yeovil.
"	3	Smithy Bridge, near Manchester—Isolation Hospital	Bucklow Union Guardians	J. H. Andrews & Butterworth, 78 King Street, Manchester.
"	3	Withington—Boundary Walls		A. H. Mountain, Surveyor, Town Hall, West Didsbury.
"	4	Knutsford—Alterations to Hospital		R. M'Beath, Architect, Bonham House, Sale.
"	4	Aughton, near Sheffield—Hospital	Shoreditch Borough Council	J. D. Webster, 19 St. James' Street, Sheffield.
"	4	London, E.C.—Artizans Dwellings	County Asylum	H. M. Robinson, Town Clerk, Town Hall, Shoreditch, E.C.
"	4	Thorpe, Norfolk—Builders' Materials, &c.		G. Smith, Clerk of Works, County Asylum, Thorpe.
"	4	Lightcliffe, Halifax—Four Houses		R. Berry, Architect, Commercial Street, Halifax.
"	4	Grange, Marden—Thirty-six Houses		J. E. Lunn, Architect, Milnsbridge.
"	5	Aldin Grange—Stationmaster's House	North-Eastern Railway Co.	W. Bell, Company's Architect, Central Station, Newcastle-on-Tyne.
"	5	London, S.W.—Receiving Wards, &c., at Infirmary	Wandsworth & Clapham Union Guardians	Landsell & Harrison, 65 & 66 Basinghall Street, E.C.
"	5	Lurgan, Ireland—Seventeen Labourers' Cottages	Rural District Council	R. H. Dorman, County Surveyor, Armagh.
"	5	Southend-on-Sea—Steps	Corporation	A. Fidler, Borough Engineer, Southend.
"	5	Stadthelthorpe—Inspector's House and Three Cottages	North-Eastern Railway Co.	W. Bell, Company's Architect, York.
"	5	Sedgefield, co. Durham—Residence, &c.	Dr. Hunton	W. H. Linton, 13 Exchange, Stockton-on-Tees.
"	5	Longford—Episcopal Residence	Rev. Dr. Hoare	T. F. McNamara, 50 Dawson Street, Dublin.
"	5	Kingsbury—Alterations, &c., to Schools	School Board	J. W. Godderidge, Architect, Tamworth.
"	5	Undercliffe—Additions to Store	Bradford Co-op. Soc., Ltd.	Rycroft & Firth, Bank Buildings, Manchester Road, Bradford.
"	5	Farsley—Mechanics' Shop, &c.	R. Gaunt & Sons	W. D. Gill, Architect, Summerfield Terrace, Stanningley.
"	5	Bradford—Shed		G. Buckley & Son, Architects, Tower Chambers, Halifax.
"	5	Crosthwaite—Vicarage		J. Bintley, 7 Lowther Street, Kendal.
"	6	Hereford—Church Restoration	Corporation	Nicholson & Hartree, Architects, Hereford.
"	6	Huddersfield—Two Semi-detached Villas	Borough Council	J. Kirk & Sons, Architects, Huddersfield.
"	6	Ipswich—Ejector Chamber	Gas Committee	E. Buckham, Borough Surveyor, Town Hall, Ipswich.
"	6	Woolwich—Steam Roller Shed, &c.	Town Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
"	6	Salford—Retort House Floor, Fittings, &c.		W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
"	7	Derby—Bricks, Cement, Lime		J. Ward, Borough Surveyor, Babington Lane, Derby.
"	7	Birr, King's Co.—Post Office & Caretaker's Residence	Rural District Council	H. Williams, Secretary, Office of Public Works, Dublin.
"	8	Longtown, Carlisle—Two Stone Bridges		J. Murray, County Surveyor, The Courts, Carlisle.
ENGINEERING:				
Feb.	27	London, E.C.—Machines, &c.	Bengal-Nagpur Railway Co., Ltd.	Secretary, 122 Gresham House, Old Broad Street, E.C.
"	27	Pentre, Glam.—Gas Mains	Rhonda Urban District Council	O. Thomas, Engineer, Gas and Water Offices, Pentre, Glam.
"	28	Doncaster—Fuel Economiser	Corporation	W. Wyld, Electricity Works, Grey Friars Road, Doncaster.
"	28	Loch Winnoch, Scotland—Bridge Works	District Committee	P. D. Alexander, Engineer, Dunmyat, Bridge-of-Weir.
"	28	Sunderland—Workshop Tools	Corporation	J. F. O. Snell, Borough Electrical Engineer, Town Hall, Sunderland.
"	28	Christiana—Swing Bridge		Ingenieurabknts Kontor, Akershus Festning, Christiania.
"	28	Linslade, Leighton Buzzard—Waterworks	Urban District Council	Sands & Walker, Engineers, Angel Row, Nottingham.
Mar.	1	Sheffield—Boiler	United Gaslight Co.	J. W. Morrison, Engineer, Company's Offices, Sheffield.
"	1	Wallsall—Heating and Ventilation of Town Hall, &c.	Corporation	J. S. Gibson, 27A Old Bond Street, London, W.
"	1	Sheffield—Overhead Tramway	United Gaslight Co.	J. W. Morrison, Engineer, Company's Offices, Sheffield.
"	3	Edinburgh—Electric Lighting Installation, &c.	Corporation	Engineer, Electricity Supply Station, Dewar Place, Edinburgh.
"	3	Leamington—Steel Suspension Foot-bridge	Urban District Council	W. de Normanville, Corporation's Engr., Town Hall, Leamington.
"	3	Queenstown, Ireland—Waterworks	London and South-Western Railway	J. H. Campbell, Town Clerk, Town Hall, Queenstown.
"	4	Salisbury—Electric Lighting	Corporation	Resident Engineer, Waterloo Station.
"	4	Glasgow—Intercepting Sewer	Urban District Council	City Engineer, 64 Cochrane Street, Glasgow.
"	4	Hexham—Wall Hoist	London County Council	R. T. Surtees, Engineer, Council Chambers, Hexham-on-Tyne.
"	4	London, S.W.—Electric Tramcars	Urban District Council	County Hall, Spring Gardens, S.W.
"	4	Mountain Ash—Bridge	Rural District Council	J. Williams, Surveyor, Town Hall, Mountain Ash.
"	4	Chale, Isle of Wight—Water-supply Works	Urban District Council	H. E. Stretton, Clerk, Council Offices, Pyle Street, Newport, I.W.
"	5	Prestatyn, Wales—Reservoirs, &c.	Manchester Corporation	Beloe & Priest, 13 Harrington Street, Liverpool.
"	5	Clayton Vale—Bridge	Tramway Department	City Surveyor, Town Hall, Manchester.
"	5	Aberdeen—Electric Tramcars	Tramway Department	J. A. Bell, Electricity Works, Cotton Street, Aberdeen.
"	5	Aberdeen—Electrical Equipment of Tramways		J. A. Bell, Electricity Works, Cotton Street, Aberdeen.
"	6	Annand, Dumfries—Waterworks	Rural District Council	J. Barbour, 53 Buccleuch Street, Dumfries.
"	6	Thurso, near Doncaster—Sewage Outfall Works	Corporation	J. Simmons, Bank Chambers, Doncaster.
"	6	Oban, Scotland—Electric Lighting Plant	Urban District Council	Burstable & Monkhouse, 14 Old Queen Street, Westminster, S.W.
"	7	Pontypridd—Electrical Equipment of Tramways	Town Council	R. P. Wilson, 66 Victoria Street, Westminster.
"	7	Bournemouth—Switchboards	Corporation	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
"	8	Bristol—Steam Fire Float		W. W. Squire, Engineer, Cumberland Basin, Bristol.
"	8	Kentmere—Bridge	South Westmorland R.D.C.	J. Brintley, 7 Lowther Street, Kendal.
IRON AND STEEL:				
Feb.	27	London, N.E.—Sewer Ironwork	Hackney Borough Council	N. Scorgie, Borough Engineer, Town Hall, Hackney, N.E.
"	27	London, N.—Manhole Covers, Gully Grates, &c.	Islington Borough Council	W. P. Dewey, Town Clerk, Town Hall, Upper Street, N.
"	27	Rainhill, Lancs—Steam Fittings, Ironmongery, &c.	H.H. the Guaranteed States Rlys. Co., Ltd.	J. Gornall, Clerk, Rainhill Asylum, Lancs.
"	27	London, E.C.—Steel Tyres	Water Committee	Secretary, Winchester House, 5 Old Broad Street, E.C.
"	27	Salford—Pipes	Hackney Borough Council	Clerk, Town Hall, Salford.
"	27	London, N.E.—Materials and Stores	Town Council	N. Scorgie, Borough Engineer, Town Hall, Hackney, N.E.
"	28	Brighouse—Ironmongery, Wrought-iron tubes		Gas Engineer, Mill Lane Works, Brighouse.
"	28	Bishop Auckland—Manhole Covers, Pipes, &c.	Urban District Council	Surveyor, Town Hall Buildings, Bishop Auckland.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL—cont.:			
Feb. 28	Earlestown, Lancs.—Steam Tubes, Bolts, Gas Fittings	Newton-in-Makerfield U.D.C.	Stores Clerk, Gasworks, Earles' own.
Mar. 1	Linslade—Water Pipes, &c.	Urban District Council	Sands & Walker, Engineers, Angel Row, Nottingham.
" 1	Halifax—Wrought-iron and Steel, Pipes, &c.	Tramways and Electricity Committee	W. M. Rogers, Borough Electrical Engineer, Foundry St., Halifax
" 1	Halifax—Stores	Highways and Tramways Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Southend-on-Sea—Manhole Covers, Lamp-columns &c.	Corporation	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Sheffield—Overhead Tramway Works	United Gas Light Co.	J. W. Morrison, Engineer, Offices, Commercial Street, Sheffield.
" 1	Blackpool—Steel Rails, &c.	Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
" 1	London, W.—Ironwork for Sewers, Castings, &c.	St. Marylebone Borough Council	J. P. Waddington, Engineer, Town Hall, Marylebone Lane, W.
" 3	Salford—Stores and Materials	Electricity Committee	C. D. Taite, Borough Electrical Wks., Strawberry Isl. Wks., Salford.
" 3	Bristol—Ironmongery, &c.	Corporation	City Valuer, Council House, Broad Street, Bristol.
" 3	Stafford—Ironmongery, Castings, &c.	Corporation	W. Blackshaw, Borough Surveyor, Borough Hall, Stafford.
" 3	Hyde—Tramway Materials	Corporation	T. Brownson, Town Hall, Hyde.
" 3	Wolverhampton—Stores	Corporation	Borough Engineer, Town Hall, Wolverhampton.
" 3	London, W.—Stores	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
" 3	London, N.W.—Smiths' Founders' Work, Ironmongery	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 3	Littlehampton—Cast-iron Pipes	Gas Co., Ltd.	Manager, Offices, Littlehampton.
" 4	Manchester—Railway Stores	Great Central Railway Co.	O. S. Holt, Secretary, London Road Station, Manchester.
" 4	London, N.—Smiths' Work, &c.	Tottenham Urban District Council	E. Crowne, 712 High Road, Tottenham.
" 4	Thorpe, Norfolk—Gas and Water Pipes, &c.	County Asylum	G. Smith, Clerk of Works, County Asylum, Thorpe.
" 5	London, E.C.—Railway Stores	Bombay, Baroda & Central India Rly. Co.	T. W. Wood, Secretary, Gloucester House.
" 5	Birmingham—Iron and Steel Ware, &c.	Interception Sub-Committee	Superintendent, Montague Street Wharf, Birmingham.
" 5	Twickenham—Castings, &c.	Urban District Council	F. W. Pearce, Surveyor, Town Hall, Twickenham.
" 5	Ashton-in-Makerfield—Stores and Materials	Urban District Council	J. W. Liversedge, Surveyor Council Offices, Ashton-in-Makerfield.
PAINTING AND PLUMBING:			
Feb. 27	Rainhill, Lancs.—Plumbing, Lead, Paints, &c.	Hackney Borough Council	J. Gornall, Clerk, Rainhill Asylum, Lancs.
" 27	London, N.E.—Oils, Paints, &c.	Town Council	N. Scorgie, Borough Surveyor, Town Hall, Hackney, N.E.
" 28	Brighouse—Paints, Oils, &c.	Urban District Council	Gas Engineer, Mill Lane Works, Brighouse.
" 28	Bishop Auckland—Paint, Oil, &c.	Newton-in-Makerfield U.D.C.	Surveyor, Town Hall Buildings, Bishop Auckland.
" 28	Earlestown—Lead, Lead Piping, &c.	Watch Committee	Stores Clerk, Gasworks, Earlestown.
" 28	Newcastle—Painting, &c., Police Station	St. Marylebone Borough Council	Property Office, Town Hall, Newcastle-on-Tyne.
Mar. 1	London, W.—Plumber's Work, &c.	Corporation	J. P. Waddington, Surveyor, Town Hall, Marylebone Lane, W.
" 3	Stafford—Painting Bridges and Fencing	Rivers Committee	W. Blackshaw, Borough Hall, Stafford.
" 3	Manchester—Paints, Oils	Urban District Council	Secretary, Rivers Department, Town Hall, Manchester.
" 3	Thames Ditton—White Lead, Oils, &c.	Corporation	A. J. Henderson, Surveyor, Council Offices, Thames Ditton.
" 3	Wolverhampton—Paints, &c.	St. Pancras Borough Council	Borough Engineer, Town Hall, Wolverhampton.
" 3	London, N.W.—Paints, Oils, &c.	Great Central Railway Co.	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 4	Manchester—Brushes, Colours, Varnish, &c.	North-Eastern Railway Co.	O. S. Holt, Secretary, London Road Station, Manchester.
" 5	Morpeth and Alnmouth—Painting Stations	Town Council	C. A. Harrison, Engineer, Central Station, Newcastle-on-Tyne.
" 7	Derby—Brushes, Paints, Oils, &c.		Borough Surveyor, Babington Lane, Derby.
ROADS AND CARTAGE:			
Feb. 27	Brixworth, Northants—Materials	Rural District Council	Surveyor, Council's Office, Brixworth.
" 27	Pentre, Glamorgan—Street Work	Rhondda Urban District Council	W. J. Jones, Surveyor, Council Office, Pentre.
" 27	Reading—Improvement Works	Sanitary Authority	J. Bowen, Borough Engineer, Town Hall, Reading.
" 27	Rochester—Roads	City Land Co., Ltd.	J. W. Nash & Son, 215 High Street, Rochester.
" 27	London, N.E.—Materials	Hackney Borough Council	N. Scorgie, Borough Surveyor, Town Hall, Hackney, N.E.
" 27	London, N.—Cartage, Materials, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
" 28	Hampton Wick—Cartage	Urban District Council	H. Fawcett, Clerk, High Street, Hampton Wick.
" 28	Tadcaster—Materials	Rural District Council	T. Scott, Surveyor, Aberford, near Leeds.
" 28	Bishop Auckland—Goods and Materials	Urban District Council	Surveyor, Town Hall Buildings, Bishop Auckland.
" 28	Durham—Materials	Urban District Council	W. Crozier, County Surveyor, Shire Hall, Durham.
" 28	Newburn-on-Tyne—Road Materials	Rural District Council	T. Gregory, Surveyor, Council Offices, Newburn-on-Tyne.
" 28	Whatehurst, Glos.—Stone, Haulage, &c.	Corporation	R. E. Stuart, Clerk, Bedford Street, Stroud.
Mar. 1	York—Stores, &c.	Corporation	A. Creer, City Engineer, Guildhall, York.
" 1	Southend-on-Sea—Materials, &c.	Highways and Tramways Committee	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Halifax—Stores and Materials	Tramways and Electricity Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Halifax—Materials and Stores	Highways and Bridges Committee	F. Spencer, Tramways Manager, Southern Depot, Halifax.
" 1	Worcester—Material	St. Marylebone Borough Council	J. H. Garrett, County Road Surveyor, Shire Hall, Worcester.
" 1	London, W.—Materials	Town Council	J. P. Waddington, Surveyor, Town Hall, Marylebone Lane, W.
" 1	Oban, Scotland—Road		K. Mearns, Engineer, Oban.
" 3	Shrewsbury—Haulage	Penn Hill Park, Ltd.	A. T. Davis, County Surveyor, Shire Hall, Shrewsbury.
" 3	Branksome, Dorset—Roads, &c.	Urban District Council	J. E. Clifton, Surveyor, Swanage, Dorset.
" 3	Larne, Ireland—Footpaths, &c.	Rural District Council	Surveyor, Town Hall, Larne.
" 3	Llandaff, Cardiff—Materials, &c.	Hornsey Urban District Council	J. Holden, 35 St. Mary Street, Cardiff.
" 3	London, N.—Road Works	Corporation	E. J. Lovegrove, Council Offices, Southwood Lane, Highgate, N.
" 3	Stafford—Materials	Urban District Council	W. Bladeshaw, Borough Surveyor, Borough Hall, Stafford.
" 3	Thames Ditton—Materials, &c.	Paddington Borough Council	A. J. Henderson, Surveyor, Council Office, Thames Ditton.
" 3	London, W.—Gravel, &c.	Bedwellty School Board	Surveyor, Town Hall, Harrow Road, W.
" 3	Tredegar, Mon.—Limestone Chippings	Corporation	C. Dauncey, Clerk, Tredegar.
" 3	London, W.—Asphalt Paving, Materials, &c.	St. Pancras Borough Council	Surveyor, Town Hall, Paddington, W.
" 3	Wolverhampton—Stores, Materials, &c.	Urban District Council	Borough Engineer, Town Hall, Wolverhampton.
" 3	London, N.W.—Cartage, Materials, &c.	Middlesex County Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 4	Hampton, Middlesex—Materials, &c.	Middlesex County Council	S. H. Chambers, Surveyor, Council Offices, Hampton, Middlesex.
" 4	London, S.W.—Materials	Corporation	H. T. Wakelam, Surveyor, Middlesex Guildhall, Westminster, S.W.
" 4	London, S.W.—Cartage	Urban District Council	H. T. Wakelam, Surveyor, Middlesex Guildhall, Westminster, S.W.
" 4	Mansfield—Street Works	Rural District Council	R. F. Vallance, Borough Surveyor, White Hart Clumbrs, Mansfield.
" 4	Wardle, Lancs.—Work and Materials	Urban District Council	V. Wilson, Surveyor, Council Offices, Wardle.
" 4	Bucklow—Materials	Urban District Council	J. Burgess, Tabley Superior, near Knutsford.
" 5	Twickenham—Materials	Urban District Council	F. W. Pearce, Surveyor, Town Hall, Twickenham.
" 5	Staines—Watering Vans	Rural District Council	G. W. Manning, Surveyor, Ashford, Staines.

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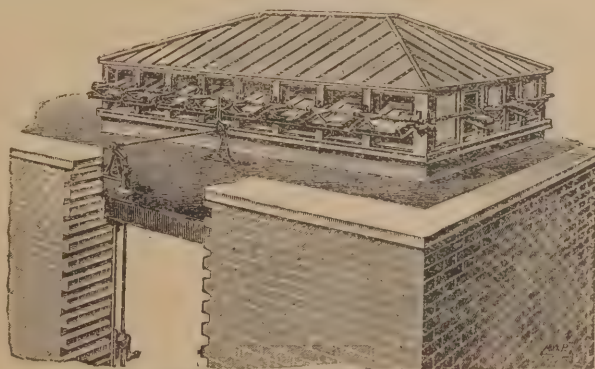
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Mar. 5	Northampton—Materials	Rural District Council	W. Tomalin, 14 Guildhall Road, Northampton.
" 5	Sunderland—Widening, &c., Road	Corporation	Borough Engineer, Town Hall, Sunderland.
" 5	West Stanley, Durham—Road Diversion &c.	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.
" 5	Wrexham—Roadstone	Rural District Council	J. O. Bury, 9 Temple Row, Wrexham.
" 5	South Shields—Materials	Corporation	S. R. Burgess, Borough Surveyor, Chapter Row, South Shields.
" 5	Ashton-in-Makerfield—Materials	Urban District Council	J. W. Liversedge, Engineer, Council Offices, Ashton-in-Makerfield.
" 5	Halesowen—Street-making	Rural District Council	W. Whitworth, Surveyor, Public Offices, Great Cornbow, Halesowen.
" 6	Colchester—Goods and Materials	Roads and Drainage Committee	H. Goodyear, Borough Surveyor, Colchester.
" 6	Croydon—Horses, Carts, &c.	Council	Borough Road Surveyor, Town Hall, Croydon.
" 6	Woolwich—Water Vans, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 6	Croydon—Materials	Town Council	Borough Road Surveyor, Town Hall, Croydon.
" 6	Lutterworth—Granite, &c.	Monks Kirby Rural District Council	J. C. Coates, District Surveyor, Lutterworth.
" 7	Derby—Stones and Materials	Town Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
" 7	Obcacle, near Manchester—Materials	Urban District Council	E. Sykes, 9 High Street, Chendale.
" 7	Hull—Stone for Macadamising	Corporation	A. E. White, City Engineer, Town Hall, Hull.
SANITARY:			
Feb. 27	Oldbury—Sewer Reconstruction	Urban District Council	J. T. Eayrs, 39 Corporation Street, Birmingham.
" 27	Ugborough, Devon—Drains, &c.	School Board	A. Warren, Architect, Buckfastleigh.
" 27	London, N.—Sewers, Disinfectants, Drain Testers, &c.	Islington Borough Council	W. E. Dewey, Town Clerk, Town Hall, Upper Street, N.
" 27	Blairgowrie, Scotland—Extension of Sewer	Town Council	G. Gunnison, Borough Surveyor, Blairgowrie.
" 27	London, N.E.—Materials	Hackney Borough Council	N. Scorgie, Borough Surveyor, Town Hall, Hackney, N.E.
" 28	Earlestown, Lancs.—Disinfectants, &c.	Newton-in-Makerfield U.D.C.	Stores Clerk, Gasworks, Earlestown.
" 28	Bognor, Sussex—Sewers, &c.	Urban District Council	W. L. Barrett, Council House, High Street, Bognor.
" 28	Bishop Auckland—Pipes, Gully Grates, &c.	Urban District Council	Surveyor, Town Hall Buildings, Bishop Auckland.
Mar. 1	Southend-on-Sea—Stoneware Pipes, Disinfectants, &c.	Corporation	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Halifax—Pipes, &c.	Highways and Tramways Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Croydon—Scavenging	Croydon Rural District Council	J. Wilson, Clerk, Town Hall, Fell Road, Croydon.
" 1	Tadcaster—Sewering, &c.	Rural District Council	Martin & Fenwick, 1 Park Place, Leeds.
" 1	Coulsdon, near Croydon—Scavenging	Rural District Council	J. Wilson, Clerk, Town Hall, Croydon.
" 1	Quorn, Leics.—Sewers	Urban District Council	W. H. Simpson, Civil Engr., The Corridor Chbrs., Market Pl., Leic.
" 1	London, W.—Sewer Pipes, &c.	St. Marylebone Borough Council	J. P. Waddington, Surveyor, Town Hall, Marylebone, Lane, W.
" 1	Ardley, near Barnsley—Scavenging	Urban District Council	T. Harper, Surveyor, Stairfoot, near Barnsley.
" 3	London, W.—Scavenging, Disinfectants, &c.	Paddington Borough Council	Surveyor, Town Hall, Harrow Road, W.
" 3	Slough, Bucks—Sewerage Works	Urban District Council	W. W. Cooper, Engineer, Mackenzie Street, Slough.
" 3	Wolverhampton—Lime, &c.	Corporation	Borough Engineer, Town Hall, Wolverhampton.

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DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
Mar. 3	London, N.W.—Scavenging, Pipes, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 3	Bishop Auckland—Sewerage Works	Rural District Council	C. Johnston, Surveyor, Crofton House, Bishop Auckland.
" 3	Chesterton, Cambs.—Removal of Refuse	Urban District Council	J. D. Bland, Surveyor, Council Offices, Chesterton.
" 3	Hastings—Sewers	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
" 3	Heaswell, Cheshire—Sewers, &c.	Wirral Rural District Council	A. Hughes, 54 Hamilton Street, Birkenhead.
" 3	Bristol—Stores		City Valuer, Council House, Broad Street, Bristol.
" 3	Manchester—Iron Sulphate, &c.	Rivers Committee	Secretary, Rivers Department, Town Hall, Manchester.
" 3	Stafford—Pipes, Lime, &c.	Corporation	W. Blackshaw, Borough Surveyor, Borough Hall, Stafford.
" 3	Thomas Ditton—Pipes, Lime, Cement	Urban District Council	A. J. Henderson, Engineer, Council Offices, Thomas Ditton.
" 4	Manchester—Stores	Great Central Railway Co.	O. S. Holt, Secretary, London Road Station, Manchester.
" 4	Glasgow—Sewer	Corporation	City Engineer, 64 Cochran Street, Glasgow.
" 4	Llandaff, Cardiff—Scavenging	Rural District Council	M. Warren, Clerk, Llandaff Chambers, Cardiff.
" 4	London, N.—Disinfectants, Lime, &c.	Tottenham Urban District Council	B. Crowne, 712 High Road, Tottenham.
" 5	Twickenham—Drain Pipes and Gutters, &c.	Urban District Council	F. W. Pearce, Surveyor, Town Hall, Twickenham.
" 5	Ashton-in-Makerfield—Materials and Stores	Urban District Council	J. W. Liversedge, Engineer, Council Offices, Ashton-in-Makerfield.
" 6	Colchester—Pipes, Lime, &c.	Roads and Drainage Committee	H. Goodyear, Borough Surveyor, Colchester.
" 7	Derby—Disinfectants, Earthenware, &c.	Town Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
" 7	Brotherton, Yorks—Sewage Works	Pontefract Rural District Council	J. Waugh, Engineer, Sunbridge Chambers, Bradford.
" 8	Alford, Lincs—Sewers, &c.	Urban District Council	F. Massie, Engineer, Tetley House, Wakefield.
TIMBER :			
Feb. 27	London, N.—Timber, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
Mar. 1	Southend-on-Sea—Timber (Spruce, Pine, &c.)	Corporation	A. Fidler, Borough Surveyor, Clarence Road, Southend.
" 1	Halifax—Timber	Highways and Tramways Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 1	Halifax—Timber	Tramways and Electricity Committee	W. M. Rogerson, Borough Electrical Engineer, Foundry St., Halifax.
" 1	London, W.—Wood Blocks, Timber, &c.	St. Marylebone Borough Council	J. P. Waddington, Surveyor, Town Hall, Marylebone Lane, W.
" 1	Salford—Timber, Wood Cleats, &c.	Electricity Committee	O. D. Taite, Borough Electrical Engineer, Strawberry Road Works, Salford.
" 3	Stafford—Timber, &c.	Corporation	W. Blackshaw, Borough Surveyor, Borough Hall, Stafford.
" 3	Bristol—Timber		City Valuer, Council House, Broad Street, Bristol.
" 3	London, N.W.—Timber and Joinery Materials, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 4	Thorpe, Norfolk—Timber	County Asylum	G. Smith, Clerk of Works, County Asylum, Thorpe.
" 5	Birmingham—Timber	Interception Sub-Committee	Superintendent, Montague Street Wharf, Manchester.
" 6	Aberdeen—Firewood	Parish Council	O. B. Williams, 20 Union Terrace, Aberdeen.
" 17	London, S.E.—Timber, Hardwood Paving Blocks	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Bermondsey.

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Mar. 1	Aldershot—Laying-out Pleasure Ground	£20, £10, £5.	N. F. Dennis, Surveyor, Urban District Council, Offices Aldershot.
" 5	New Malden, Surrey—Public Offices, Fire Station, Mortuary, &c.	£25, £10.	C. T. Lewis, Clerk, Maldens and Coombe Urban District Council, 7 Market Place, New Malden.
" 12	Antrim—Labourers' Cottages	£10.	J. Clark, Clerk, Rural District Council, Antrim.
" 14	Dunstable—Infectious Diseases Hospital	£5 6s.	C. C. S. Benning, Town Clerk, Dunstable.
" 15	London, S.W.—Military Ambulance Wagons	£500, £250.	Director-General of Ordnance (O. 7), War Office, Pall Mall, S.W.
" 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Edge, Sheffield.
" 29	Aldershot—Public Offices, Fire Station and Town Hall ..	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
" 31	Wakefield—Improvement of Interior of Exchange Buildings ..	£25, £10.	J. J. Martin, Bull Hotel, Wakefield.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
" 8	Oldham—Market Hall and Shops	£50, £30, £20.	S. A. Pickering, Borough Surveyor, Oldham.
" 21	Coleraine—Twenty-five Workmen's Dwellings	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

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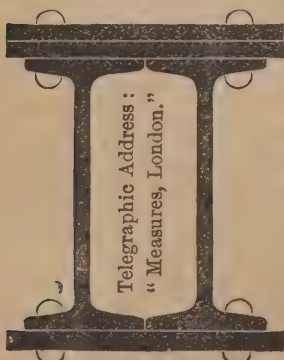
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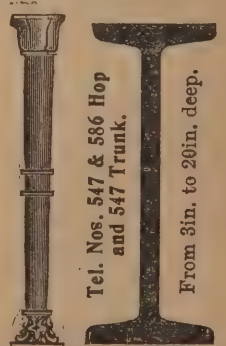
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MARCH 5, 1902.
No. 369.

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Royal Academy Exhibition, 1902.

The receiving day for architectural works is
Thursday, March 27th. We shall be pleased, as
in previous years, to receive drawings from
intending exhibitors and to forward them (free
of expense) to Burlington House. In order
that careful reproductions may be made for
publication, it is requested that drawings be sent
as early as possible. No drawings can be
received by us later than noon on the sending-in
day.

An Architectural Causerie.

The Late J. F. Bentley. WE little thought when we
published the portrait of Mr.
J. F. Bentley as the Royal

Gold Medallist for 1902 that in two weeks' time it would be our mournful duty to chronicle his death. Even as recently as Friday evening he was looking over his splendid cathedral at Westminster and seemed well and hearty then; yet the next evening he died of paralysis in a friend's house in London; and thus is added another name to that tragic list of architects whose fate it is to be swept away when in the midst of their life-work. Mr. Bentley had previously been seized with paralysis on two occasions, the more recent of which had seriously impaired his speech; and he seems to have been sadly conscious of the improbability of seeing his cathedral finished. One who knew him well describes as absolutely pathetic the way in which he would stand evening after evening, within the shadow of the great tower of the cathedral, gazing long and fixedly at its gradual advance towards completion, and then turning away with a sigh, which his friend interpreted as the expression of his doubt as to whether he would witness the carrying out of his designs in their entirety. The tragedy of Mr. Bentley's death is intensified by the fact that on Monday evening it was the object of the Royal Institute of British Architects to elect him as the recipient of the Royal Gold Medal "for his work as an architect"; but now he is beyond such honour: his architecture, however, remains, and will always be looked upon as the effort of a great mind inspired with noble ideas, culminating in the most original of modern cathedrals. We hope next week to publish an appreciation of the late Mr. Bentley, with some illustrations of his work.

Building Patents MR. GERALD BALFOUR'S new
Bill for amending the Patent
and the New Bill. Law is noteworthy as marking

a radical change from the practice hitherto upheld in this country; that is to say, it countenances preliminary examination in a mild form, though, as yet, it does not approach the stringency or the effectiveness of the American and German systems. The fact that letters

patents are granted here for ideas that have already been patented makes the existing system ludicrous as well as injurious, for the general assumption is that the Patent Office seal affords an absolute protection, whereas some patents are not worth the paper on which they are printed. If the new Bill becomes law, on receiving an application the Patent Office officials will search the specifications of the previous fifty years, and if none of them anticipates the idea in question the inventor will receive his patent in the usual way, subject, however, to the payment of an additional £1, which thus increases the stamp duty to £5. If the idea has been anticipated the Comptroller will inform the applicant, who may, if he wish, amend his specification so that it satisfies the examiners; but even if he declines to do this he can still obtain his patent, though it will bear the information of having been anticipated. The objection is raised that such a course will not damage the

Upper Baker Street, for many years the home of the famous actress Mrs. Siddons, is about to disappear. Mrs. Siddons occupied the house from 1817, after her retirement from the stage, till her death in 1831. She added some rooms to the original building, using one of them as a studio in which she did her clay-modelling. Mrs. Siddons took to this pursuit with great ardour, and attempted one or two figures on a grand scale. Here, too, she used to give reading parties, which were attended by many famous personages who delighted to hear the Queen of Tragedy declaim passages from Shakespeare and the old dramatists. Washington Irving was amongst these visitors, and the famous American author has put on record his feelings of delight at hearing Mrs. Siddons recite the passages spoken by Constance in "King John." It seems a pity to pull the old house down, as it stands in a splendid position commanding a fine view of one of the entrances to Regent's Park,



NO. 27, UPPER BAKER STREET, LONDON, N.W.: MRS. SIDDONS'S HOUSE.
DRAWN BY H. J. PALMER.

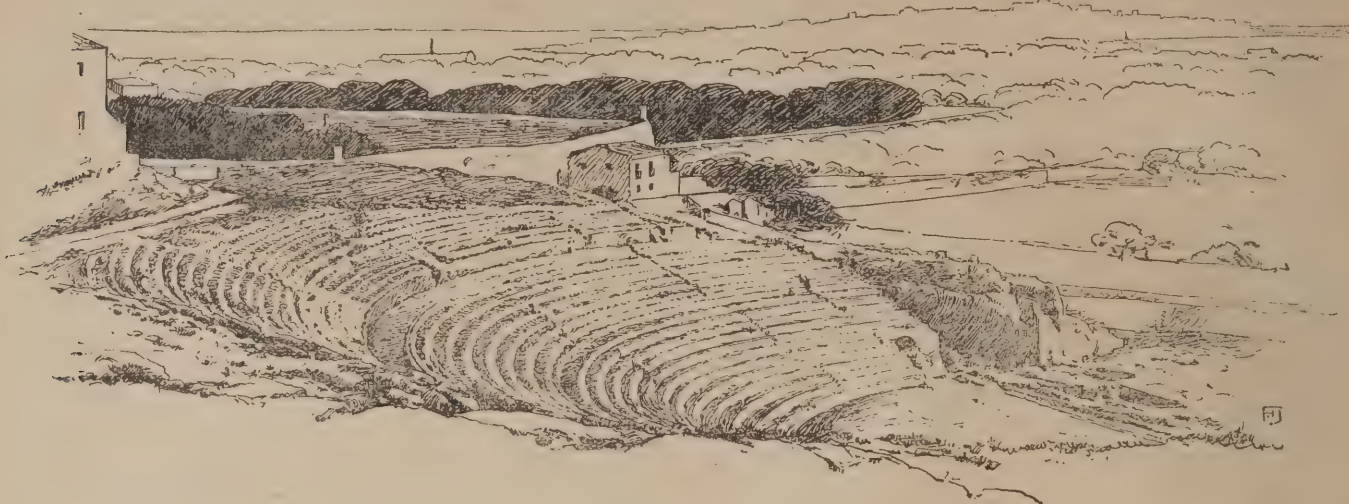
bogus patentee and that consequently the Bill is futile; but it seems to us that the fact is not appreciated by thus making known the anticipation of an invention the Patent Office will be preventing a very great number of persons proceeding with ideas that are "obviously old" and worthless: and this view of the matter is particularly true when building patents are considered. Amateurs and faddists have always been very prone to invent something connected with building operations—house fittings, chimney tops, and other similarly hackneyed appliances—and consequently one finds scores of specifications which are nothing more than duplicates of others, with such slight differences, of course, as shall satisfy the official red-tapeism and peace of mind. Under the new Act, whatever its other shortcomings may be, almost all of these old patents will be prevented from reappearing in new disguise; so that the inventors themselves will be saved money and the manufacturers be rid of a great deal of bother.

Mrs. Siddons's
House.

ALL who take an interest in historic London houses will learn with regret that, in consequence of railway improvements, No. 27,

Sculpture for Blackfriars Bridge.

IN Blackfriars Bridge we have the unsuccessful attempt of an engineer to be architectural, the stumpy granite columns being specially unsatisfactory, as they are unconstructional, having no weight to support. At present, however, the Bridges Committee of the City Corporation have under consideration the scheme of embellishing the bridge with sculpture in commemoration of the Coronation, the suggestion being to place four equestrian statues of four Edwards on the pedestals at either end of the bridge. This scheme, however, is really a revival of that mooted twelve years ago, when a competition even was held, two prizes of £250 and £150, two of £150 and two of £100 being offered for the best models. Yet, after all this waste of time and energy, the scheme was abandoned in 1886. The present proposal is nothing like so extensive (the cost of the former one was £30,000), and though the bridge would certainly be improved by the addition of sculpture, we think a more satisfactory object might be selected for embellishment: for, however fine the sculpture, the bridge will mar its effect.



THE GREEK THEATRE, SYRACUSE.

SICILY AND ITS ARCHITECTURAL MONUMENTS.—IV.

By F. HAMILTON JACKSON, R.B.A.

(Continued from p. 448, No. 366.)

THE line to Syracuse on leaving Catania at first runs across the plain of Catania, still regarded as the granary of the island. Passing Valsavoia, the junction for Caltagirone, the lake of Lentini is approached, a lake which did not exist when Leontinoi was founded by colonists from Naxos in 729 B.C., as they say. Gorgias the orator, whose eloquence induced the Athenians to intervene in the quarrels of the Sicilians, was a native of this place, and near here Diodorus says that wheat grew wild in his day. Between Lentini and Syracuse the line approaches and follows the coast, discovering many delightful coves, where the barren-looking rocks are relieved by the deep blue of the sea upon which little fishing boats show their white sails like sea birds floating on the waves. Augusta, a city founded by Frederick the Second in 1232, and peopled with the inhabitants of Centuripe (which Cicero mentions as the richest town in Sicily) which was destroyed in 1233, occupies as some think the site of the ancient Xiphonia and makes a picturesque and splendid appearance with its castle on the hill and the houses grouped about its feet; backed up by the blue sea which almost surrounds the promontory. Around this Megarean bay ancient sites are pretty numerous. Here was Megara Hyblaea, celebrated for its honey, Alabon, and the peninsula of Thapsus, so well known in connection with the Athenian campaign against Syracuse. The railway still skirts the coast below the ancient walls of Achradina, and reaches the station, which lies beyond the ancient Agora, where one upright column and several lying on the ground, with four bases *in situ*, mark the spot.

At Syracuse the interest of the Greek period is so much greater than that of subsequent or previous times that many people practically ignore the latter altogether; which may give greater vividness and strength to the impressions of the one period, but causes one to lose a great deal of interest, since much lies outside of it. The principal antique remains are the following. In Ortygia, the modern city of Syracuse, the cathedral, in the walls of which are embedded the columns of a temple thought to be the celebrated temple of Minerva which Verres despoiled of so many of its beautiful works of art; the poor remains of a temple of very ancient date, thought to have been dedicated to Apollo from an inscription found on the site, but by some said to be that of Diana; the fountain of Arethusa and the antiquities collected in the museum, which include the celebrated statue of Venus; a large collection of objects found in the Megarean graves and a few early Christian objects. In Neapolis, the Greek theatre,

the Roman amphitheatre, the altar of the hecatombs and the Latomie or ancient quarries, and in Epipolæ the fortress of Euryelus. The early Christian and mediæval remains include the church of S. Giovanni, from which the crypt of San Marsciano and the catacombs are entered; the church of Santa Lucia; the Palazzo Montalto and other palaces, many of them now in a ruinous state. The Greek theatre was the largest structure of its kind after those of Miletus and Megalopolis, and is nearly 165yds. in diameter. Forty-six tiers of seats may still be traced, but there were probably fourteen or fifteen more. The nine "cunei" or sections were intersected by a broad and a narrow "præcinctio" or gangway following the same curve as the seats, and on the broad one are Greek inscriptions recording the names of King Hiero, the Queens Philistis and Nereis, and Zeus Olympius, after whom the different compartments were named. The eleven lower rows were covered with marble, and above the upper rock-cut ones may be seen the holes for the masts which sustained the velarium. This theatre was constructed in the fifth century B.C., and here Dionysius the First (406-367 B.C.) came to see his dramas produced, sitting in a place which is still pointed out as his chair. This was the man who so much extended the fortifications of the four cities, who was regarded as the most powerful prince of his time next to the King of Persia, and who died at the age of sixty-three from a surfeit, caused by feasting to celebrate his victory at Athens in a tragic contest. Above the theatre is the nymphæum, a grotto into which two water-conduits issue, and higher still is the Street of Tombs, now without any decoration and with empty tomb chambers. From this place the eye ranges over the fertile plain towards Ortygia, on one side of which is the smaller harbour, and on the other the greater, in which the great seafight took place in 413 B.C. between Athenian and Spartan under the eyes of the citizens of Syracuse, whose cries to the combatants are said by Thucydides to have been like the strophe and antistrophe of the theatre, and some of whom no doubt viewed the fight from this very place. Between the two harbours modern Syracuse glitters white against the blue African sea.

The Roman amphitheatre is a little to the east. It is not mentioned by Cicero, and Tacitus is the only Roman writer who refers to it, so it is probably of the time of Augustus; no architectural features of importance remain. Its length is 77yds. and its breadth 44yds. The steps were covered with marble and on the edge of the arena the names of the owners of the places were marked and still remain here and there. The great altar lies just below. Hiero the Second built one which was a stadium long (292yds.). This one is 215yds. long and 25yds. broad, and is probably the same, and it was upon it that the annual sacrifice of 450 oxen which commemorated the expulsion of the tyrant Thrasybulus was offered. It has a projecting cornice and base and looks like a long

podium. Under the church of S. Nicolò close by is a cistern sustained by fourteen thick piers. From the theatre it is a walk of from 1½ to 2 hours across the site of Neapolis and Epipolæ to Fort Euryelus, where the two walls of Dionysius met. Here there are five massive towers, flanked by two deep fosses cut in the rock, and from these fosses a number of subterranean outlets connected with each other and united by staircases, some of them magazines, some stables, &c., communicate with the great court behind the towers, while another leads to a fort on the wall further to the north. The rings cut in the stone for tethering horses are still visible in many places and the Greek numbers by which one part was distinguished from another. These subterranean chambers and passages received light either from great circular apertures in the roof or from openings cut in the rock almost on the level of the soil. The walls are formed of blocks about 4ft. 6in. long, 2ft. high and 2ft. 4in. thick, being themselves generally rather more than 10ft. thick, but increasing sometimes to nearly 15ft. and occasionally lessening to about 7ft. The joints are carefully worked and a line is chiselled along them. On the north side, where the Carthaginians attacked, the work is rougher. High walls also divided Epipolæ from the next city, Tyche, but a subterranean way along which four horses could go abreast united the two. The aqueducts entered Epipolæ beneath Euryelus, passed through almost parallel to the wall of Dionysius, and after having furnished Tyche and Achradina with water crossed the sea by the Porto Piccolo, terminating in Ortygia. There were a number of apertures in them, like wells, from which the citizens could draw water, and some of them are in use still.

The cathedral is probably the ancient temple of Minerva, since that was used as a landmark by the Greek sailors, or at least the lofty tower behind it upon which was the brilliant figure of the goddess, and the cathedral is still used for the same purpose by sailors of the present day. Moreover the twenty Doric columns still visible on one side or the other, with their archaic caps show that it was an ancient temple, and its size, which is about 61yds. in length and 24yds. in width, about the same as that of the temple of Neptune at Paestum, shows that it was an important one. These columns are 28ft. high and 6½ft. thick. It was converted into a church by Bishop Zozimus in 640 A.D. and the font was then brought from S. Giovanni. It is of marble, carved into the shape of a "krater" with two handles, and stands upon a pavement of small mosaic of the Cosmati type, with a base of bronze upon which are eight lions, each holding up his paw in an aimless manner, since the shields which no doubt were once there are gone. When the Saracens took the city in 878 it was converted into a mosque, and Saracenic battlements still crown the Doric entablature on the north side. Near to the font is a finely carved marble doorway apparently of the thir-

teenth century. Later alterations have robbed interior and façade of interest. The descriptions given by Cicero of the grandeur of this temple are dazzling. Several subterranean baths exist in Syracuse, to which one descends by forty or fifty steps. The castle, which contains one of them called the Bath of the Queen, was reconstructed by the Byzantine general George Maniaces, and some of his work still remains, though the decorative sculpture has been removed. The celebrated fountain of Arethusa, planted with papyrus and tenanted by gold fish, is enclosed in a semicircular pit railed round, as J. A. Symonds said, "like a bear pit." The fact that the water is now salt suggests that perhaps this was one of the ends of the aqueducts, damaged by an earthquake, though it is known that at Cefalù and in other places fresh-water springs rise on the shore as near to the sea as this is. The Passeggiata Aretusa close by is a pleasant promenade, planted with palms and other trees and shrubs which are exotic in England; it affords an excellent view over the larger harbour, and is a place in which one may enjoy the sea-breezes. Between the station and the town are the remains of a Roman gymnasium to which a semicircular bath is attached—a few fragments of frieze and cornice are still to be seen, but except for them the interest lies mainly in the plan.

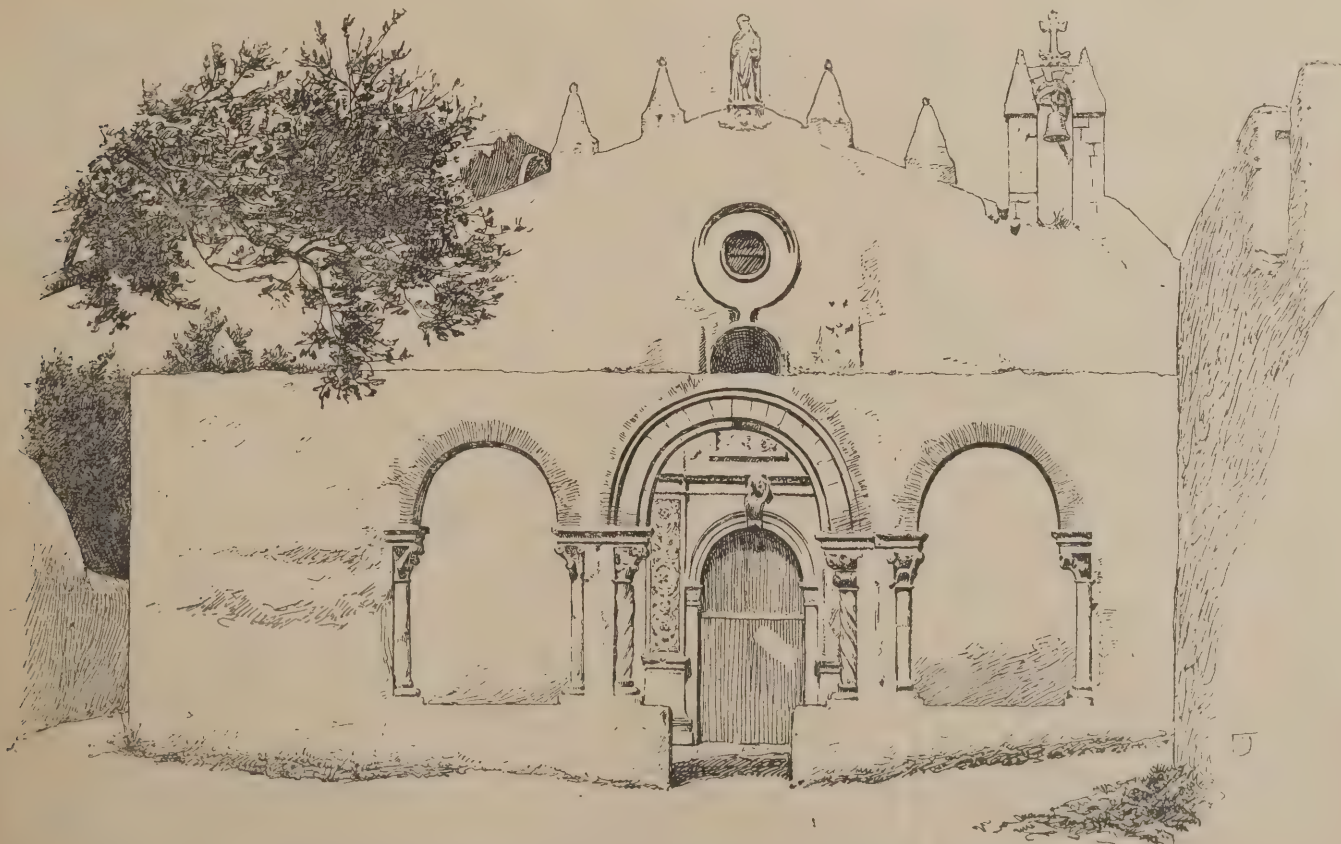
The most important of the Christian monuments is the church of San Giovanni, founded in 1182 but afterwards frequently restored, within which are two large fluted columns which are said to have belonged to a temple of Bacchus of which there are other remains in an adjacent vineyard. Of the original building the only remains are portions of the west side, including a fine rose window, and a screen wall in front of the entrance doorway, a portion of the ancient porch or narthex. It is through this church, however, that one descends to the catacombs and the crypt of St. Marcan, which dates from the fourth century, and according to legend marks the place where St. Paul preached when he landed at Syracuse and tarried for three days. These catacombs date from the same period, and the large circular chambers which are a peculiarity of them point to their having been used as places of assembly from a very early period. They contain no remains of inscriptions or architectural decoration. The crypt is perhaps the most ancient Christian church in Sicily.

The plan is a Greek cross, four columns with caps bearing the symbols of the Evangelists supporting the roof of the central bay. From this, round-arched vaulted chapels open in each direction, through one of which the stair from the church above descends, and the angles are filled with other chapels in which, to the right, is the tomb of St. Marcan, fenced off with a low wall covered with relatively modern painted tiles. In front of it is the bishop's seat, an Ionic capital turned upside down. In the opposite corner is a column of Egyptian granite to which the saint was tied before suffering martyrdom, and here is also a rock altar at which they say St. Paul celebrated. The church also contains a few very early Christian reliefs and some badly-preserved equally early frescoes. The church of Santa Lucia is not far away; originally erected in the eleventh century on the spot where the tutelary saint of the town suffered martyrdom, but so often restored that the west door is the only portion of that period now remaining. It has columns made up of several different pieces and dilapidated lions crouching on the caps. The carving is in many places sharp and good, of Byzantine type, showing considerable use of the drill.

One of the special peculiarities of Syracuse is the "Latomie" or quarries, from which at different times the stone has been extracted for the building of the walls and edifices which have now vanished for the most part, now turned into sheltered gardens in which trees and plants flourish with great luxuriance. It was in one of these, thought to be the Latomia dei Cappuccini (where also Theocritus wandered in the days of Hiero), that the unhappy Athenian prisoners languished for eight months, till a pestilence breaking out warned the Syracusans of the wisdom of getting rid of the survivors, who were sold as slaves. The Latomia del Paradiso they say was cut by Carthaginian prisoners in the time of Gelon, the tyrant who died in 478 B.C. amid the universal grief of Syracuse and the praises of all historians of the time. In the "Ear of Dionysius," an opening off this Latomia, some excavations made some time since to ascertain the depth of the earth disclosed, 33ft. below the surface, the capital and lower parts of a column still upright. This gives one some idea of the ancient fertility of the country, though at the present time a great part of it appears to be barren rock.

According to Greek tradition Archias the Corinthian was the founder of Syracuse, in the year 734 B.C. according to an inscription in the museum at Oxford, but as he had to "drive out" the Siculi first it is evident that there was a Siculan town there already. The Siculi were reduced to the condition of serfs, according to the custom of the Greek republics, whose splendid freedom was built upon the foundation of slave labour. The government was conducted by the aristocracy, the "Geomoroi," but there was constant ferment and fighting between them and the common people, the "Cillhi," which resulted in Gelon, the tyrant of Gela, becoming supreme in 485 B.C. and transferring his residence to Syracuse. His greatest glory is the terms which were offered to the Carthaginians when they were conquered at Himera by the Syracusans and the Agrigentines. These terms stipulated for the return of the Carthaginians to Africa and the cessation of their attacks upon Syracuse, for an indemnity of 2,000 talents of silver and the erection of two temples in Syracuse to the Grecian gods, and "that the Carthaginians shall henceforth abstain from sacrificing human victims to their Saturn, a holocaust which cannot be acceptable to a divinity, and from feuds against the rights of men." The treaty was to be engraved on brazen plates and fixed up in the temple of Jupiter. The Carthaginians were so grateful for these humane conditions that they sent a golden crown of the value of 100 talents to Demareta, Gelon's wife.

After the reign of Hiero the First, at whose court Æschylus, Pindar, Simonides, Epicharmus, Sophron and Bacchylides flourished, and the expulsion of Thrasybulus, the supremacy of the city gradually extended over nearly the whole island, but the Athenian war made sad inroads on its prosperity, though it issued in the defeat of Athens. Next its territories suffered from the Carthaginian incursions and the two Dionysius and Agathocles lorded it over the town with a brief interval of democracy under Timoleon. Other tyrants followed, and Hiero the Second, whose court Theocritus and Archimedes adorned, became the ally of Rome, while a few years after his death it was taken by Marcellus, and sank to the condition of a Roman provincial town. The exactions and spoiliations of Verres gave occasion for Cicero's splendid orations, in which he describes the conditions of many parts



CHURCH OF S. GIOVANNI, SYRACUSE. DRAWN BY F. HAMILTON JACKSON, R.B.A.

of Sicily and among other towns mentions Syracuse, and enumerates precious objects which Verres had carried off; and this description shows that great splendour still remained to it at this time, since he calls it "the largest of Greek, and the most beautiful of all cities." At the height of its prosperity it contained 500,000 inhabitants.

It now because of no special importance though it suffered many things at the hands of the Greeks of Byzantium and of the Saracens, whose taking of the town was marked by especial barbarity. Its trade is unimportant, and though it is the seat of a bishop and of a prefect its inhabitants only number 23,600.

(To be continued.)

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Books on Roof Carpentry.

BELFAST.—AJAX writes: "Kindly name some books dealing with the design and construction of timber roofs for churches."

The only book on church roofs is Brandon's "Examples of Timber Roofs," 4to, with many plates (to be obtained from Mr. B. T. Batsford, 94, High Holborn, for £1 4s., published at £3 3s.). This has a good series of illustrations of ancient work. Roof carpentry in the ordinary way is dealt with in the standard books on this subject, such as Tredgold's, Fletchers', or Collings's "Roof Carpentry" (2s.).

Tile Manufacturers.

Referring to the enquiry on p. 30 of our last issue, the address of Messrs. J. & W. Wade & Co. is—The Flaxman Tile Works, Burslem, Staffs. (London office: 4, Thavies Inn, E.C.)

Books on Carpentry and Building.

ASCOT.—H. S. C. writes: "Kindly forward catalogue of books relating to carpentering, building, &c."

Write to Mr. B. T. Batsford, 94, High Holborn, W.C., for his list.

Liability of Architect for Smoky Chimneys.

BIRMINGHAM.—A. B. C. writes: "Is an architect responsible to his client for smoky flues? The house was built twelve months ago, and much trouble, annoyance and expense have been caused by several of the flues smoking: many types of cowls have been fitted, but all to no purpose. The architect superintended the building of the flues, and all the usual precautions were taken. Can the client enforce his architect to pay for the cowls and labour?"

An architect is liable if he does not exercise reasonable skill and care, but it is very difficult to determine what that is. If an employer accepts the services of an architect whom he knows has had limited experience and training he does so at his own risk, and the architect is not liable. If an architect can prove that he took such steps as any architect would have taken in a certain case he is under no liability. It would be absurd if an architect were held responsible for smoky chimneys, as the causes are generally beyond his control, due to surrounding trees or overtopping buildings, &c., and if the usual precautions were taken in building the flues there is no liability. The client, we do not consider, can force the architect to pay for cowls and labour.

Repairing Leaky Concrete Flat.

ENQUIRER writes: "A concrete flat, the roof over a large room, averages 6in. thick and has a slight gradient towards the gutters, all floated with 2in. cement, 1 to 1. The wet comes through one part sufficiently to disfigure and damage the ceiling. Can you suggest a composition to prevent this? It would spoil the gradient if I had the part cemented over again,

and whatever is done must be at the least possible cost."

We advise you to coat the part through which water percolates with pitch or asphalt. The latter is more expensive, but is more lasting and stands much wear.

Deadening Sound between Bedroom and Kitchen.

ASHFORD.—DISTRACTED writes: "The principal bedroom in my house is over the kitchen, and all the talking of servants and every sound that takes place in the kitchen is distinctly heard in the bedroom. The ceiling of the kitchen is not plaster but 'compo-board.' I have had the floor boards of the bedroom taken up and fully 9in. of sawdust put between each joist, but this makes not the slightest difference. I do not want to take down the ceiling and sawdust and substitute a plaster ceiling, as this would incur much inconvenience and expense. The bedroom fireplace is in the same stack as and directly over the kitchen range, so that the slightest movement of the dampers is heard distinctly in the bedroom. Can you suggest a remedy?"

We advise you to take the floor boards up and put two thicknesses of felt under them. The best remedy would be to remove the present ceiling and use, say, Frederick Jones & Co.'s silicate cotton and plaster slabs. We do not see how you can stop the noise from the kitchen dampers being heard in the bedroom.

Books on Building Stones, Architectural History and Timber.

SUNDERLAND.—ENQUIRER writes: "(1) Please recommend a book on the formation of Building Stones. I have 'Specification' No. 5, Rivington and Mitchell, but I want one to assist me in locating the stones as far as possible in their original formation: also a map of England showing where the different stones crop up. (2) Would Mr. Banister F. Fletcher's book be sufficient for the history section of the R.I.B.A. examination, and what book would you recommend for the mouldings' section? (3) Can you recommend a book on the timbers in use in this country?"

(1) Hull's "Treatise on Ornamental and Building Stones of Great Britain and Foreign Countries," 12s., Macmillan & Co. Geological maps are sold by George Philip & Son and Edward Stanford. (2) A list of works which should be consulted is given in the R.I.B.A. Calendar, 2s. 6d. (3) "The Practical Timber Merchant," by W. Richardson (Crosby Lockwood & Son, 8s. 6d.).

Book on Theodolite.

STAFFORD.—A SUBSCRIBER writes: "Which is the best book on theodolite work, setting-out, &c.?"

"Land and Engineering Surveying" by H. S. Merritt and G. W. Usill (E. & F. N. Spon, 12s. 6d.).

Book on Perspective.

PERSPECTIVE writes: "Please recommend a good book on architectural perspective to study at home."

"Linear Perspective," by G. A. T. Middleton, (B. T. Batsford, price 1s.).

Architects' Registration.—At a meeting of the Plymouth, Devonport and Stonehouse branch of the Devon and Exeter Architectural Society held last week at Plymouth an address was given by Mr. Silvanus Trevel, F.R.I.B.A., P.S.A., on "The Statutory Registration of Architects." Mr. Charles King, F.R.I.B.A., president of the Three Towns branch, took the chair. A resolution approving the principle of statutory registration was carried unanimously.

Chelsea Baths Competition.—Mr. R. Norman Shaw, R.A., the assessor in this competition, placed the designs with the following numbers in order as the best:—Nos. 21, 45, 14, 15, 26 and 47. The Chelsea Council have, however, reversed the order of the first two, awarding the first place to No. 45, by Messrs. Harnor & Pinches, of John Street, Adelphi, W.C., and the second place to No. 21, by Messrs. Wills & Anderson, of Adam Street, Adelphi, W.C. No. 26, which takes the third place, was by Mr. F. J. Smith, F.R.I.B.A.,

R. I. B. A.

SMOKE ABATEMENT.

A SPECIAL general meeting of the Royal Institute of British Architects was held last Monday evening (Mr. William Emerson presiding) to elect the Royal Gold Medallist for the year. Mr. Emerson said he had to announce the saddest thing in the annals of their history, the death of Mr. Bentley, whose name had been submitted for election. The Council under these circumstances could not fix upon any course until the King had decided what was to be done, whether to give the medal to Mr. Bentley's family or not. A letter of condolence would be sent to the widow of Mr. Bentley. Mr. Emerson then referred to several of the best known works of Mr. Bentley, among them being the Brooklyn Roman Catholic Cathedral at New York; St. Mary's, Cadogan Square, Chelsea; the church of the Holy Rood at Watford; the restoration of St. Botolph's in the City; the decorations for St. Mark's, North Audley Street, London; the Priests' Seminary at Hammersmith; the church of Corpus Christi at Brighton; and the church of St. Francis at Notting Hill, W.

A general meeting followed. Mr. Charles Henry Gage having been elected an Associate, Sir Benjamin Stone, chairman of the National Photographic Record Society, gave a short account of the aims and methods of the Society, in reference to an exhibition of about a hundred photographs of architectural work, forming part of the collections of the Society, which is on view till Saturday next prior to the collections being deposited in the British Museum. Mr. Alexander Graham, the treasurer of the Society, testified to the value of the work it was doing.

Sir William B. Richmond, K.C.B., R.A., then moved the following resolution: "That in view of a resolution of the Coal Smoke Abatement Society, seeking the co-operation of the Institute, members are invited to join the Society, or that such other assistance be given by the Institute as the Council may deem desirable." Sir William Richmond urged the architectural profession to use every effort to get smokeless grates adopted in buildings of all kinds so as to purify our atmosphere and prevent the detrimental effect it has on buildings.

Mr. John Slater seconded, and Prof. Church referred to the action of soot in absorbing the acids, tarry matter and ammonia vapours produced in the combustion of coal and in depositing them on buildings, and so becoming the chief cause of corrosion.

Dr. Des Vœux spoke of some experiments he had carried out with Mr. Bryan Donkin on ordinary grates and open-fire grates claimed to be smoke-consuming. Five "smokeless" grates had been tested and four had been found to materially diminish the smoke, while one of the four practically did away with any smoke and gave 50 per cent. greater heat than the best of ordinary fires, and burnt 25 per cent. less fuel than the best of the grates tested and 50 per cent. less than the ordinary grate. An account of these tests would shortly be published in full in "The Lancet." He suggested a central body should be formed to test various grates and decide the best to use. Gas was cheaper and better for use in kitchens for cooking, &c., the only difficulty being to get hot water, but he had found this was best obtained by using a coke boiler, which cost about 1s. 6d. per week in the summer or 2s. in the winter, giving for this sum hot water at any hour of the day or night.

Mr. W. D. Caröe suggested that the gas companies would find it a paying investment if they installed, free of expense, gas burners under grates in the houses of the poorer classes which could be used for lighting coke fires. By this means the present grates could be used for giving smokeless and cheaper fires at a very little expense for alteration.

Dr. G. Wyld said a blower prevented smoke to a great extent, but it was surprising how few were used in connection with ordinary grates.

Mr. E. W. Hudson, Mr. Julian Corbett and Mr. C. H. Brodie also spoke. The resolution was carried unanimously.

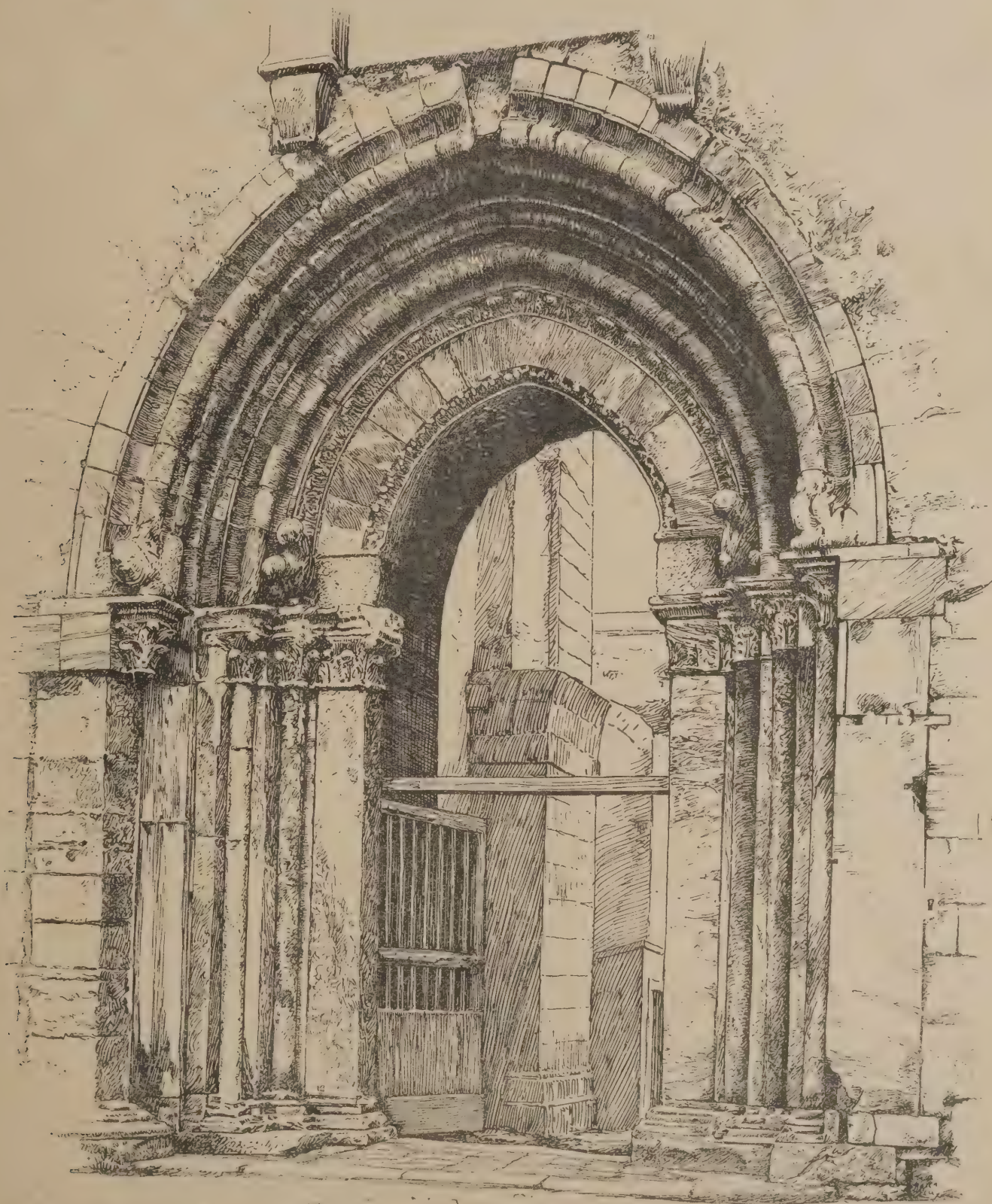
L.C.C. BRICKLAYERS.

At last week's meeting of the London County Council the Finance Committee presented a report in regard to the number of bricks laid per day by the bricklayers employed in the construction of works by and for the Council.

Lord Welby said that a specified number of bricks was arrived at by taking the actual number of bricks used, divided by the number of days. The time did not include the cutting and rubbing. He did not think it desirable to give

the actual price paid, and the Sub-Committee on Works did not think they were justified in giving the actual number of bricks laid in the Works Department. Mr. Beachcroft asked Lord Welby whether he knew that in the construction of the Westinghouse Works the number of bricks laid per man per day was 1,400. Mr. Burns asked what was the thickness of the walls, was mortar or cement used, and did the work in any way resemble the class of work done by the Council on fire stations or lunatic asylums. Lord Welby said that one class of work was hardly comparable with another. Captain Swinton moved

that the report be not received, and pointed to the gravity of the charges made in "The Times." They were not there to make London the cockpit for Socialistic theories. Mr. R. Williams said that, taking everything into consideration, he should be satisfied if a man laid from 350 to 400 bricks a day. Mr. Taylor was astonished that so much importance should be attached to the scribbles in "The Times" on questions of which they knew nothing. He had a very shrewd suspicion that this attack was organised by brick manufacturers. It was true that bricklayers now laid fewer



GATE OF THE CASTLE OF MANICES, SYRACUSE. DRAWN BY F. HAMILTON JACKSON, R.B.A.

bricks per day than they did twelve or thirteen years ago, but the hours of labour had been shortened and the class of work now demanded was very different. No complaint was made in regard to workmen restricting their output until they definitely refused to scamp work any longer. He challenged any one to say that the workmen did not at present give better work than ever before. Mr. White pointed out that neither Mr. Taylor nor any previous speaker had denied that the number of bricks stated in "The Times" as being laid per man per day was right. There was really no difficulty in finding out whether "The Times" was right or not. It was an extraordinary omission that no specific account had been kept of the cost of brickwork in the Works Department. The whole result of the operations of the department showed that they were not getting enough work for the money. Sir A. Arnold could not imagine any one reading the report and considering it quite satisfactory. He saw considerable objection to the committee's stating the number of bricks laid by bricklayers on any job. If they were to mention any particular number it might be taken as a maximum standard for the future. The committee might, however, with advantage give the cost of the brickwork per rod. The information given in the report was, perhaps, not quite satisfactory, but he could see no reason for rejecting it.

In the course of the debate reference was made to an estate that is being developed in the suburbs. The houses specified were three-storey semi-detached villas, let at £55 to £60. The external walls for ground and first floors were 14 in. material, and division walls 9 in. and 4½ in. The labour on brickwork was let piecework. One man laid 2,000 bricks in foundations the first day, and four subsequently laid no fewer than 4,300 London stock bricks till the job was nearly done and two of the men were taken off to start a new house.

On a division 87 voted for the reception of the report and 26 against. The report was then received.

New Patents.

These patents are open to opposition until April 5th.

1901.—Window-Blind Brackets.—2,203. J. CHALLENGER, 21, Beaumont Road, North Ormesby, Middlesbrough. The bracket has a slot at one end to receive the roller-pin, and cast on the other end is a wood screw about an inch long: consequently no screw-driver is needed, so that the bracket can be fixed very quickly.

Cement Pipes.—5,045. F. E. BOCQUET, 35, Boulevard Haussmann, Paris. Expanded metal is bent into pipe form and wound round with wire (or a layer of asphalted cloth may be introduced). This strengthening framework is then covered with cement inside and out.

Laying Damp-courses.—5,759. A. DISS, 21, Stanwell Street, Colchester. This invention consists of a cast-iron frame having parallel side-bars arranged to slide and be fixed on two cross-bars, so as to suit the width of the wall. After the damp-course is laid this frame is slid along the top of the wall, and so forms a true and uniform course having clean edges and requiring no raking or pointing.

Slag Cement.—23,443. C. VON FORELL, 26, Deichstrasse, Hamburg. Highly-molten slag is driven by a powerful jet of steam against a chilled surface protected by smooth iron plates, so that it becomes flattened and falls into a cooling drum, which can also be used as a transporting apparatus. The resulting clinkers are altogether different in their structure from slag granulated in the ordinary way, being desulphurised and made ready for grinding.

The following specifications were published on Thursday last, and are open to opposition until April 12th. The name in italics is that of the communicator of the invention. A summary of the more important of them will be given next week.

1901.—2,653, WILSON, appliance for removing obstructions in gulleys, pipes, &c. **2,904, WRIGHT,** building bricks and blocks. **3,969, DOWNIE,** lift valves. **5,678, RICHTER,** ap-

paratus for moistening air. **6,223, CHARMAN,** folding combination ladders, stepladders, trestles, &c. **6,433, VIQUIS,** lock. **6,835, HOWELL,** casement stay fastenings. **6,844, ERSKINE,** machines for rolling felt. **7,258, GEOFFROY,** compositions for removing paints. **11,337, CORBETT,** apparatus for manufacturing white lead. **19,608, MAHER & BARNER,** machines for grinding, smoothing and polishing glass. **23,583, GREEN,** ventilating roofs of stables, cowhouses, &c. **23,724, MAY,** window-sashes. **24,114, SWEETING,** fastener for window-sashes. **24,557, SACHS,** fuse plugs for electric cut-out blocks. **24,798, KELLY,** heat-insulating board, tile or slab. **24,906, DAY (Roberts),** gates. **24,948, GUILLOU,** parquetry or separable floorings, boarded ceilings, &c.

1902.—50, GIBBARD, wood-paving for covered footways or floors. **90, JONES & JONES,** airtight inspection-covers for drains. **386, WOLSKEL,** preparing asphalt.

Keystones.

The New Millbank Board School, erected by the School Board for London in Erasmus Street, Westminster, was opened last week.

Moorfields derived its name from the filling in by water of a large space caused by the removal of clay for pottery and bricks.

New Cold Stores are about to be constructed in Tooley Street, E.C., by the London Cold Storage, Ltd. The architect is Mr. W. H. Waterman, of 7, Cullum Street, E.C.

The Manchester Hotel, Hull, has been remodelled. Mr. James Martin, Temple Street, was the contractor for the building, plastering and joinery work; Mr. C. G. Brett for the ironmongery; Wokes & Co. the electric lighting; and Mr. Fred Sweeting for the marble work.

Acoustics at the Law Courts.—Mr. Justice Buckley has caused to be fitted a series of transverse wires beneath the roof of the Chancery Court, with a view to the improvement of the Court's acoustic properties. In this respect the Law Courts are notoriously defective.

Christ's Hospital.—Lord Balfour of Burleigh has issued his award arising out of the arbitration recently heard between the Governors of Christ's and St. Bartholomew's Hospitals. The amount to be paid by the authorities at St. Bartholomew's for the 67,630 sq. ft. of land taken is £238,781.

The Swansea Harbour Trust.—Offices are now being erected from the competitive designs of Edwin Seward, F.R.I.B.A., of Cardiff, which were selected by the assessor, Professor Fawcett, M.A., of Cambridge. Cattybrook bricks, with dressings and bands of Portland stone, are being used on a sub-storey of green-tinted Bridgend stone.

Camberwell Infirmary.—The following particulars came to hand too late last week for publication in the same issue as the illustrations:—The new buildings of the Camberwell Infirmary cover a site of about 4½ acres. The principal or west frontage is that shown in our view, being towards Brunswick Square. The infirmary is otherwise bounded by Brunswick Road on the north, Havil Street on the east, the Glebe road on the south. The infirmary when complete will consist of the central administrative block containing all the offices, committee rooms, &c., the residence of the medical superintendent, of the matron and sisters; six large blocks for patients, containing in all beds for 716 adults and eighty-eight children; the female staff home, with ample accommodation for the large staff of nurses and servants necessary for such an institution, receiving rooms, isolation wards, kitchen block, steward's stores, with residences for men over, laundry for patients and staff, with boiler-house, engine-rooms, &c., in the basement. The mortuary, post-mortem room, stabling, &c., are to the south of these. The buildings will be heated by hot water and lighted by electricity. The lifts will be electric. There is an operating theatre with anæsthetic room, laboratories, &c., attached. The whole building is connected by glass-covered ways. The contractors are Messrs. Holliday & Greenwood, of Brixton. The architect is Mr. Edwin T. Hall, F.R.I.B.A., of 54, Bedford Square, W.C.

Trinity Congregational Church, Walthamstow, is being enlarged from designs by Mr. Williams Durnford, of 100c, Queen Victoria Street, E.C.

The Band of Hope Jubilee Building is being erected at 59 and 60, Old Bailey, E.C. The architect is Mr. Rowland Plumble.

Three Stained-Glass Windows at Churchill have been placed in the Wesleyan schoolroom. The school is part of a Gothic block of buildings including a chapel. They have been executed by Mr. James P. Young, of 382, Gloucester Road, Bristol.

The Court of Common Council have agreed to raise the salary of the principal clerk of the Works Department from £500 to £600; that of the assistant architect for buildings and assistant architects for repairs from £400 to £450, and that of the assistant to the measuring surveyor from £300 to £360 by increments of £15 per annum.

Hull Improvements.—The Prince of Wales has been invited by the City Council to visit Hull in September or October next for the purpose of inaugurating a new city square, to unveil a memorial statue of Her late Majesty to be erected in the square, and also to lay a memorial stone in connection with the extension of the Hull Royal Infirmary.

The Manchester Society of Architects held its monthly meeting on 13th February. Mr. A. Darbyshire, president, in the chair. Mr. Charles M. Hadfield, A.R.I.B.A., read a paper on English architecture of the fifteenth century, illustrated by lantern views. The prize for the students' monthly competition was awarded to Mr. Warren Blackshaw, junior, of Stockport, for a design for a factory chimney.

Honey found in a Roof.—A big find of honey has just been made at Tydd St. Mary, Lincolnshire. For some years past there have been two swarms of bees in the roof of Strawberry Hall, the residence of Alderman T. W. Banks, who offered the honey to anyone who would shift the bees and make good the roof. Mr. Carbutt, builder, of Long Sutton, accepted the offer and obtained nearly 20 stones of honey.

"Humour in Greek Art" was the title of a paper by Mr. Arthur Hamilton Smith read before the Hellenic Society last week. He said that in the survivals of early art it must be admitted that the humour was often unconscious, and one laughed at rather than with the artists. At the same time, it was sometimes clear that the painter or sculptor realized the effect which would be produced on the critical observer.

A Chapel at Norwich has been erected in the grounds of the Norwich and Ely Diocesan Training College as a memorial to Canon Hinds Howell. Mr. Bodley, R.A., is the architect. The plans have been only partially carried out, as the chancel and cloister connecting the chapel with the main building have yet to be provided when funds permit. The chapel is dedicated to St. Etheldreda.

The Garden City Association is making good progress. Among its latest adherents are the Lord Bishops of London and Hereford, Mrs. Marie Corelli, Madame Sarah Grand, H. G. Wells and W. H. Lever: while of its members, the Countess of Warwick and Mr. T. P. Ritzema (the new manager of the "Daily News") are indefatigable. The present quarters of the Association at 77, Chancery Lane are becoming inadequate for the work to be done.

The Tenancy of Leighton House has been transferred by the proprietors to Mr. and Mrs. Russell Barrington, and who have undertaken till further notice the whole responsibility of the maintenance of Leighton House and the safe keeping of its contents. With respect to the concerts, lectures, loan exhibitions and the arrangements for admitting the public to view the house and its contents, everything will continue to go on exactly in the same way as heretofore, under the management of the same persons who formed what was called the Entertainment Sub-Committee. All pupils of the Royal Academy and other art schools on showing their students' tickets will be admitted free on all week-days not only to view the house and the permanent collections but any loan exhibition that may be on view.

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"THE GABLES," FOUR OAKS, NEAR BIRMINGHAM: GARDEN FRONT. A. S. DIXON, Architect.



"THE GABLES," FOUR OAKS, NEAR BIRMINGHAM: ENTRANCE FRONT. A. S. DIXON, Architect.

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"THE GABLES," FOUR OAKS, NEAR BIRMINGHAM: MODELLED PLASTERWORK IN BAY
BY ERNEST GIMSON.

Bricks and Mortar.

APHORISM FOR THE WEEK.

*In all new work that would look forth
To more than antiquarian worth,
Palladio's pediments and bases,
Or something such, will find their places.*
CLOUGH ("Dipsychus").

Our Plates.

THE house at Four Oaks, near Birmingham, was built for Mr. Montague Fordham and enlarged to its present size for Mr. A. E. Hills, the present owner. It is built of local brick, plastered with cement mixed with local sand, which, being red, produces in combination with the cement a warm brown colour. It is roofed with old tiles taken from houses recently pulled down in Birmingham. The modelled plasterwork in the bay-window of the drawing-room is by Mr. Ernest Gimson, of Pinbury, Cirencester. The architect is Mr. Allen S. Dixon, M.A., of 297, Broad Street, Birmingham.—"Bardencroft," Saltburn-by-the-Sea, has been erected for Mr. William I'Anson, upon a corner site, the front overlooking the beautiful public gardens, with an extensive sea-view beyond. The entrance has a south-west frontage. The building is of red brick having a red tiled roof with yellow rough-cast gables. The whole of the woodwork being painted white produces a very pleasing effect.

Brighton Aquarium.

BRIGHTON AQUARIUM is proposed to be improved by the Town Council at a cost of £30,000. It is proposed to do away with the existing theatre-stage, property and artistes' rooms—and the three tanks immediately adjoining it, and utilise the site thus obtained for a concert-hall, with new stage, gallery and the necessary retiring-rooms. The space now used as a stage and property room will revert to its original purpose as a waterfall. The wooden covered way from the entrance gates to the entrance hall will be replaced by a decorative covered way of glass and iron, and a new external porch to the entrance hall provided. Over the new concert hall and waterfall terraces will be formed. A great amount of repairing and decorative work and many minor improvements are proposed, improved heating apparatus, and the substitution of electricity for steam power generally. Mr. Tiltman's estimate of the cost of the work is £29,098.

Tudor and Elizabethan Architecture.

Mr. T. COLLINS, curator of the Art Museum, Ancoats, in delivering a lecture on "Tudor and Elizabethan Architecture," said this style of building was the result of a

gradual growth of an improved spirit in society. The Tudor style was the result of a blending between the castellated or semi-Norman style and that of the debased Gothic; and the mixture of the Tudor with the Italian or classical architecture gave us what is known as the Elizabethan. It was during the early period of English architecture that this movement towards the domestic style of architecture received its greatest impetus by the law of King Henry II., which forbade any building to be fortified without special permission. The progress was furthered again by the action of King Edward I., who after conquering Wales, desired to live with his Welsh people and built for himself the castles of Conway and Carnarvon. Here the oriel chamber, the oratory, and the use of glass for windows indicated an attention to domestic comforts. Another cause helping on the movement was the disbandment of the Freemasons by King Henry VI. Perhaps the

two most important causes were the growth of heraldry as a decorative means and the Reformation, the last named being the cause of bringing to an end the construction of Gothic ecclesiastical buildings. John of Padua, who was appointed shortly after the accession of King Edward VI. to be deviser of the King's buildings, was probably the first to introduce the classic features of buildings.

Restoring York Minster.

FOR nearly three years a massively-built scaffolding has enclosed the north-west tower of York Minster, leaving only the topmost parapet and pinnacles—200ft. above the pavement—exposed to view. The restoration of the upper portion (about 80ft.) has now been accomplished; three of the eight stages or storeys of the scaffolding have been taken down and the fourth will soon follow. Only absolutely necessary renewals have been carried out. Wherever possible, the old work has been retained. In many cases, however, the action of the atmosphere had practically eaten everything away and the staff of carvers had then to make careful copies of Perpendicular work under the direction of Mr. Green, the Minster clerk of the works, and these were submitted to Mr. G. F. Bodley, A.R.A., for his approval before being placed in position. Each of the four faces of the tower has been thoroughly repaired. Care has been taken to make all the new work solid and to have it well bonded in. The tracery of the four huge belfry windows, through which "Great Peter" sounds forth, has been taken down and partially renewed. The mullions were even in worse plight than the tracery; they had to be removed, and other stones, moulded as they were, stood in their stead. Finials, gables and gargoyles had also to be re-erected. The scaffolding cost £800; and although the staging has stood for nearly three years no expenditure for keeping it in repair has been necessary. The magnesian limestone used in previous restorations has not worn well; the face having peeled: this, however, is most rapid where the stone is sheltered from the rain, as may be seen from the present condition of the unrestored portions of the west front. Where the stone has been freely exposed to the rain the surface is almost unbroken, which, so far as it goes, is evidence that the rainwater neutralises the effects of the atmospheric acids. In the present restoration the authorities have discarded magnesian limestone in favour of a cross-grained oolite obtained from Ketland in Rutlandshire.—(Extracts from the "Yorkshire Herald.")



DRAWING-ROOM, "THE GABLES," FOUR OAKS, NEAR BIRMINGHAM. A. S. DIXON, ARCHITECT.

Builders' Notes.

Mr. F. Clarke, builder, Yoxford, died recently.

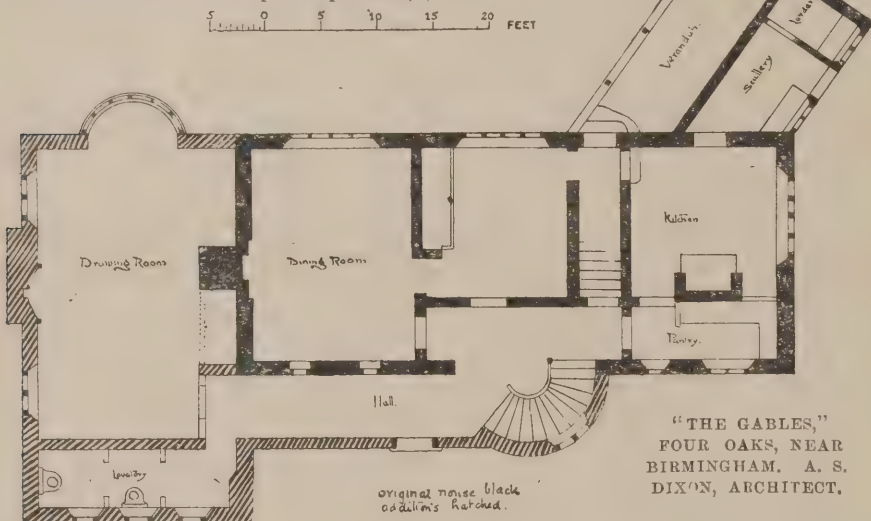
Mr. Isaac Osborne, builder and timber merchant of Diss and Roydon, died recently at the age of sixty years.

The Oldham and District Master-Builders' Association held its annual dinner recently. Mr. S. Smethurst, J.P., presided. The annual report stated that the membership numbered 144, an increase of thirteen during the year, and that the financial position was also satisfactory.

Three Tenders Equal.—A remarkable result occurred in the tendering for a shop at Wealdstone, Harrow. Messrs. Clarke & Charles were the architects, and no quantities were supplied. The three firms of builders competing sent in exactly the same price, namely, £650. The result will be found stated in full in our "Tenders" columns.

Re William Fear.—The adjourned first meeting of this debtor (a builder of 138, Jedburgh Road, Plaistow) was held last week in the Court of Bankruptcy. The statement of affairs showed liabilities £27,308, of which £4,128 was expected to rank, and assets nil. The debtor attributed his failure to losses through speculative building. He made no proposal to the creditors.

The Builders' Clerks' Benevolent Institution held its annual meeting last week. Mr. Frederick Dove, of Messrs. Dove Brothers, presided. The report stated that £697 13s. 3d. had been received in the course of the past twelve months, and the sum of £586 8s. had been paid in pensions,



in addition to £10 in temporary grants. There were twenty-five pensioners on the books—a record number for the society. On the motion of Mr. O. Newling a resolution was adopted enabling provincial members of the trade to take advantage of the benefits of the institution.

The Plumbers' Registration Bill, piloted by Lord Glenesk, passed through a Committee of the House of Lords last week.—A public meeting of health and water authorities and plumbers of the North of England was held in Carlisle recently. Alderman Crowder, ex-Mayor, presided. On the motion of Bailie Dick, chairman of the Health Committee of Glasgow, seconded by Mr. C. W. Hill, chief sanitary inspector, Carlisle, it was resolved that the Government, acting in the public interest, should carry through the measure.

The Aberdeen Master House Carpenters' and Joiners' Association held its annual dinner recently. Mr. J. A. Smith (of D. Macandrew & Co.), president of the association, occupied the chair. Mr. John Brown, of Redhall, gave the toast of "The Architectural Profession," associating with it the name of Mr. James Souttar, who received his training in the office of the late Lord Provost Matthews, who had done splendid architectural and public works in Aberdeen. Mr. Souttar, in reply, suggested that in the matter of contracts master-builders should make sure at the outset that these were properly and legally drawn, for it was better to have one lawyer at the beginning than two lawyers at the end.

Correspondence.

Architectural Examinations.

To the Editor of THE BUILDERS' JOURNAL.
LONDON, S.E.

SIR,—My attention has been called to Mr. Howard Seth-Smith's letter in your issue of February 19th. I should like to point out that "the first principle" to which he alludes has never been departed from, namely, that the Royal Institute should be the sole examining body for England under the proposed Registration Bill. The Society of Architects has passed through various stages of criticism. It was formerly accused of receiving anyone who chose to apply. While not admitting this as a fair imputation, it eventually decided that all candidates under a certain age should pass a qualifying examination before being proposed to "membership." Surely there can be no harm in this restriction, especially as a certificate of having passed the R.I.B.A. examination is accepted in lieu of this Society's examination. The members surely have the right of saying who shall or who shall not be admitted into the Society, and it was only with the object of raising the standard of efficiency that an examination was decided upon. From the first I felt Mr. Seth-Smith was taking a wrong view of the case, and he appears still to persist in opposing a harmless test of qualification for membership.

ship, although it has greatly assisted the work of the Society and raised the standard of efficiency of its members. I cannot understand a past-president of our Society stating that he "shall continue to oppose the policy it is pursuing by every possible means." He is quite welcome to do this, but he will find it a much more useful and congenial task to advocate the legal registration of every properly-qualified architect of which he professes still to be an advocate.—Yours truly,

ELLIS MARSLAND,
Hon. Secy., Society of Architects.

Society of Architects.—Messrs. C. H. Stott (Pietermaritzburg, Natal) and A. Swash (Newport, Mon.) have been elected members of this Society, and Messrs. H. T. Cook (Southend-on-Sea), S. C. Hanson (Southend-on-Sea) and W. D. Williams (Redruth, Cornwall) have been elected students.

The New Denbigh County Schools are being erected between Middle Lane and Beacon's Hill. The building is designed in the Tudor style, and is faced externally with limestone. The main walls are lined with brick, and all inside walls are also of brick. The contract for the erection of the school buildings, exclusive of furnishing and of boundary walls, fences, drives, &c., is £23,000, the contractor being Mr. G. H. Marshall, of West Smethwick, near Birmingham, who is carrying out the works from the designs and under the superintendence of Mr. James Hughes, architect, Denbigh.

Engineering Notes.

Mr. Arthur Pye-Smith, managing director of the well-known St. Pancras Ironwork Co., Ltd., has lately been appointed a justice of the peace in the county of Middlesex.

St. Andrew's Church, Colyton, has lately been fitted with "small tube" hot-water heating apparatus by Messrs. John King, Ltd., engineers, Liverpool, who have employed their economical coil-heater with waterway firebrass.

Avonmouth's New Dock.—The tender of Sir John Aird & Sons, of Westminster, contractors, has been accepted by the Bristol Docks Committee for the constructional works of the new ocean dock at Avonmouth. The amount of the tender is slightly under £1,400,000. There were fifteen tenders, and the highest exceeded £2,000,000. The work is to be finished in five years, and is estimated to cost £2,000,000 in all.

Illuminations for the Victor Hugo Fetes in Paris.—The E.L.B. system, which the public are only just commencing to take up in this country for the coming Coronation festivities, has again had a remarkable success to report from Paris, where the municipality placed the whole of the contract with the Electric Lighting Boards Co. for the illuminations in connection with the great Victor Hugo ceremonies recently. These illuminations comprised a temporary installation of no fewer than 25,000 8-c.p. lights.

Margate Water-Supply.—A poll of the ratepayers of Margate has been taken on the proposal to promote a Bill in Parliament for powers to carry out a scheme of water-supply. A scheme has been devised by the borough engineer, Mr. Albert Latham, to obtain a supply from the hills in the district of Wingham, 14 miles from Margate. The scheme is estimated to cost £90,000, but the corporation have agreed, in order to avoid opposition, to supply fifteen parishes in the district, and powers are sought in the Bill to borrow £120,000. More than 3,000 votes were recorded in favour of the proposal and 1,700 against.

Masters and Men.

A Slate Famine Feared.—A number of slate merchants in North Wales are busily stocking slates, as it is feared that a slate famine is imminent. There are already indications that trouble is looming ahead irrespective of the deadlock at Lord Penrhyn's quarries. The men are busily enrolling themselves in the Quarrymen's Union, and since the beginning of the year the membership of that union has rapidly been increasing. At Festiniog, where close upon 6,000 quarrymen are employed in the different mines, matters are decidedly disquieting. Trades union feeling is strong, and the workmen maintain that as the price of slates has increased and that the market generally has improved they ought to have a share in the benefit. No actual application has been made for an increase of wages in a formal manner, but this may be expected at an early date.

The Law as to Picketing.—The Parliamentary Committee of the Trades Union Congress has published the proposals of the committee for protecting the funds of trade unions in view of the recent decision as to the liability of unions for the acts of their members in picketing cases. The salient feature of the clause proposed to be made operative by legislation is that "peaceful persuasion" by pickets, if it does not foster breach of contract, shall be permissible, and that such action shall not be deemed a "watching or besetting" within the meaning of the Conspiracy and Protection of Property Act, 1875. With reference to the safeguarding of trade union funds, the committee submits a suggestion that each union should have a subsidiary limited liability company registered under the Companies Acts, 1862 and 1890. This company would attend to the sick and benefit business, and would have the power to make grants in loans to the union with which it was connected, should that union be in need of funds at any time.

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IDEAL PLUMBING.—II.

By G. A. ALLAN, Plumbing Instructor, Trades Training School.

(Continued from p. 438, No. 865.)

THE form of intercepting trap to be used will depend on the amount of fall that can be given to the drain. Those are best which have a vertical drop of 3 in. from the drain into the trap (Fig. 5). The sewage falling on to the body of water in the trap has a tendency to drive under the surface and carry with it any matter floating in the body of the trap. When the available fall for the drain is very slight 3 in. cannot be spared for this form of trap. One must be used with inlet and outlet at the same level (Fig. 6). The diameter of the trap should be restricted at its lowest parts, as it is then more self-cleansing. Every intercepting trap should be provided with a cleaning arm or socket doors (as shown in Figs. 5 and 6), by means of which a rod can be passed into the section of drain between the interceptor and the sewer.

With iron drains laid in the manner recommended the ordinary manhole with half-channel is not built. Manholes are built round the access pipes, but they need not be water-tight. The movable doors on the access pipes are more easily manipulated if the bottom of the manhole be about 1 ft. below the bottom of the pipe. Ordinary galvanised-iron manhole covers can be used; those that lock are preferable to those that have no fastening.

At the head of all drains having a fall of less than 1 in 40 a flushing tank should be placed; an automatic flushing tank should be fixed where they are allowed; when these are not allowed a tank flushed by pulling a chain is fixed. It should be a definite part of someone's duty to flush the drain each day. I have seen a flushing tank holding about 250 gals. fixed at the head of a drain and receiving the waste water from a bath and a lavatory basin. The waste water remained in the tank until the accumulation filled it, and when a further discharge would start the syphon and discharge the tank. This was good for the drain, but the retention of foul water on the premises was bad and the inside of the tank smelled abominably. A tank fixed to receive rainwater and to be flushed automatically when it had not the same defect, but was useless in a drought, when the drains needed flushing most.

The question as to what material soil-pipes shall be composed of is still debated in this country. In America the question was long since settled in favour of iron. W. P. Gerhard in his "Drainage and Sewerage of Dwellings" says, "I shall not dwell on the well-known defects of lead soil-pipes; although still the rule in England, they have, fortunately, in this country become a thing of the past, and when found upon examination of houses built years ago are invariably condemned and removed."

In England until recently the question was definitely settled, but in favour of lead. Now iron soil-pipes are used on good work; they are regulated by by-laws of the London County Council, and there is no doubt that their use is tending.

The requirements of the London County Council with regard to the thickness and weight of cast-iron drains and soil and ventilation

cast-iron soil-pipes of the thicknesses and weights specified by the London County Council. Soil-pipes should be fixed outside the building. In cases of re-draining existing buildings it may be necessary to fix the soil-pipes inside the building. In London in such a case the by-laws require the soil-pipe to be of lead. Wherever lead is not compulsory iron soil-pipes should be used. A large experience both in England and America as plumber and sanitary inspector compels me to the conclusion that in requiring the use of lead for inside soil-pipes the London County Council have made a mistake, and as the model by-laws of the Local Government Board issued thirty-four years ago are still considered "model," so a by-law once issued by the London County Council is supposed to remain unaltered to the end of time. It is not likely therefore to be amended.

The soil-pipe should be carried up on brackets (Fig. 7) about 3 in. from the wall, as by this arrangement they are accessible all round. Ventilation pipes should be carried up in a similar manner. Both soil and ventilation pipes should be carried up to a position clear of all windows and chimneys and as high as the ridge of the roof of the building against which they are fixed. No cowl should be used, but the open ends of the pipes should be protected by ordinary balloon wire-guards.

In lecturing at the Sanitary Institute the late Sir Douglas Galton was very emphatic not only as to the uselessness of all cowls on soil and ventilation pipes but as to their pernicious influence. He said that the open end of the pipe would ensure as good an upcast as any cowl. If a greater current were desired than the open end of the pipe would yield, it could always be obtained by enlarging the pipe for 1 ft. or more at the top. By adding, say, 2 ft. of 8 in. pipe to the top of a 4 in. soil-pipe the upward current in the 4 in. pipe would be quadrupled. The wind blowing across the open end of the pipe induces an upward current in the pipe depending not on the diameter but on the force of the wind. The current in the 8 in. pipe would be as great as it would be in a 4 in. pipe open at the top; and as the area of the 8 in. pipe would be four times as great as that of the 4 in. pipe the current in the 4 in. pipe must move four times as fast to supply the air extracted. In practice the current produced by the wind blowing across the open end of a 4 in. pipe is as great as

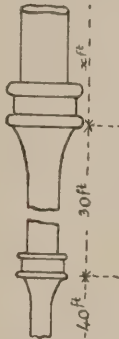
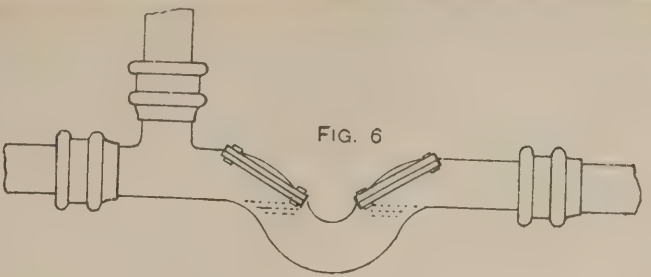


FIG. 11

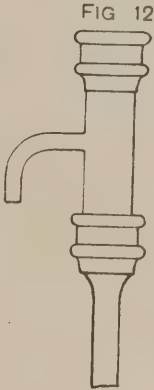


FIG. 12



FIG. 13

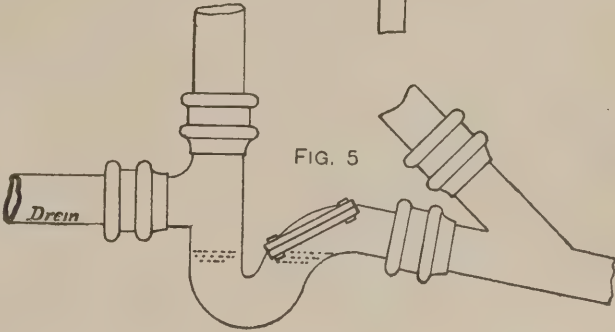


FIG. 5

only cause an upcast when wind is blowing. In calms, when no upcast is caused by wind, the slight movement of air due to differences of temperature between the inside and outside of the drainage system will not be obstructed by the open end of the pipe as it would be by a cowl. Some sanitarians advocate the use of a cowl because, though they acknowledge it has no other use, it prevents a downdraught. But if the drain is ventilated as hereafter recommended no harm can possibly be done by downdraughts.

Every branch of the soil-pipe should be ventilated to prevent stagnation of drain air in the branches. With foul gases in the soil-pipe and in contact with the water in the closet traps the water soon becomes saturated with the foul gases which are given off on the house side of the traps.

This does not occur when the soil-pipe branches are ventilated. This branch ventilation is best accomplished by connecting a 2 in. pipe to the branch near the trap. This 2 in. pipe also acts as an anti-syphonage pipe to the trap. It should be connected to the soil-pipe about 3 in. from the highest part of an S trap or about 9 in. from the highest part of a P trap.

This trap ventilation-pipe, as it is generally called, should be carried up at the side of the soil-pipe and should terminate at the same level. It should never be connected to the soil-pipe above the highest branch, as is always recommended, but should be kept quite distinct. When a water-closet on an upper floor is flushed the descending water drives the air in the pipe before it and draws air after it. On account of the friction of the air moving in the pipe and the difference of weight between the air and the water, the descending water tends to create a vacuum in the pipe and so rarifies the air above it. The water falling past the soil-pipe branches tends to draw the air out of those branches, and by reducing the air-pressure on the drain side of the traps it tends to allow the atmospheric pressure on the house side of the traps to displace the water—in ordinary language

For Drains.			For Soil and Ventilation Pipes.		
Internal diameter.	Thickness of metal not less than	Weight per 9ft. length (including socket and beaded spigot or flanges, the socket not to be less than 3/4 in. thick) not less than	Diameter.	Thickness of metal not less than	Weight per 6ft. length (including socket and beaded spigot or flanges, the socket not to be less than 3/4 in. thick) not less than
in.	in.	lbs.	in.	in.	lbs.
3	3/8	110	2	3/8	23
4	1/2	160	3	1/2	40
5	5/8	190	4	5/8	48
6	3/4	230	5	3/4	54
			6	7/8	69
					84

is wanted, and extra current obtained by means of a cowl or an enlargement of the extremity of the pipe is undesirable. Either a cowl or the open end of the pipe will

to syphon the traps. The 2in. anti-syphonage pipe is to supply air in place of that drawn by the falling water instead of allowing air to be drawn through the traps. But if the 2in. pipe be connected to the upper part of the soil-pipe where the air is already rarified the good done by the 2in. pipe is partially nullified, and air is still liable to be drawn through the trap. If however the 2in. pipe be carried to the external air separately, the effect of the flushing of other closets than that to which it is connected is not felt.

The traps of all water-closets should be ventilated whether or not two or more are connected to the same soil-pipe or whether the trap is connected directly to the drain. When only one water-closet is fixed on a soil-pipe the trap may safely be ventilated into the soil-pipe.

The best size for soil-pipes is 3in. diameter. This is large enough for any practicable number of closets and not too large to be self-cleansing. Larger soil-pipes are often recommended and fixed on account of dangers from syphonage, but that is a matter to be guarded against by anti-syphonage pipes rather than by enlarged soil-pipes.

Soil-pipes should be fixed in straight lines whenever possible. When change of direction is necessary easy bends should be used rather than bends of 90deg. Each bend and junction should be fitted with access doors as in the case of the drain (Figs. 9 and 10). The metal faces and seats for these doors should be planed, so that a red-lead joint may be readily and neatly made. No permanent joint in connection with drainage

ordinances" require the anti-syphonage pipe connected to a water-closet trap to be of 2in. diameter for the first 40ft., 3in. diameter for the next 30ft., and 4in. diameter for the remainder of its length (Fig. 11). The trap ventilation-pipe has to be run up separately as high as the soil-pipe and not branched into the latter.

In the neighbouring city of Minneapolis the trap ventilation-pipe may be connected to the soil-pipe above the highest branch, but the soil-pipe must first be increased to 6in. diameter (Fig. 12). In both cities the anti-syphonage pipes must be increased in diameter according to the number of traps ventilated.

When the soil-pipe is at or near the head of the main drain or a branch drain, it will act as a ventilation-pipe for the drain. The main drain and all branch drains should be ventilated at or near their highest parts. All the drain-ventilation pipes (including the pipe to ventilate that portion of the drain between the intercepting trap and the sewer) should be carried a little higher than the ridge of the roof. When the drain on the sewer side of the intercepting trap is ventilated there is no fear of sewer-gas getting into the house-drain. With all the ventilation-pipes carried above the roof the pipes at each end will act indifferently as inlets or outlets depending on the direction of the wind and the flow of sewage flowing in the pipes. Under these circumstances a draught in any of the soil- or ventilation-pipes becomes a very trivial matter.

Inlets placed above but near the ground are liable to give off unpleasant smells in case of

ordinary mica flap-valve—but without the mica—makes as good an arrangement as any.

In the drainage of stables, cow-sheds and other buildings for the keeping of live stock the same rule as to the absence of openings to the drain should be followed as is applicable in the case of houses. The drainage should be effected by means of white-glazed stoneware channels set on a sufficiently thick bed of good concrete, jointed with cement, and covered with heavy galvanised-iron gratings. Such a channel should run along the rear of the stalls the full length of the house, with branches up the centre of the horse stalls for about one-third of their length. The channel should pass through the wall and discharge into a trapped gulley outside. The iron gratings are lifted and the channels cleaned out and sluiced down daily.

(To be continued.)

Law Cases.

A Disputed Contract.—At the Sussex Assizes recently the case of *Brockway v. Roberts* was heard, in which the plaintiff, a builder at Burgess Hill, brought an action against the defendant for damages for an alleged breach of contract. The plaintiff stated that on the invitation of Mr. C. T. Gillam, who was acting as architect in the matter for the defendant, he tendered for building alterations at Bolney Grange in May last, the amount of his tender, which was the lowest, being £1,620. The tender was accepted and the contract signed, nothing then



FIG. 7

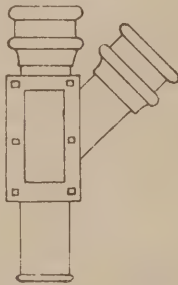


FIG. 9

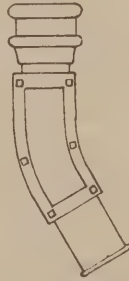


FIG. 10

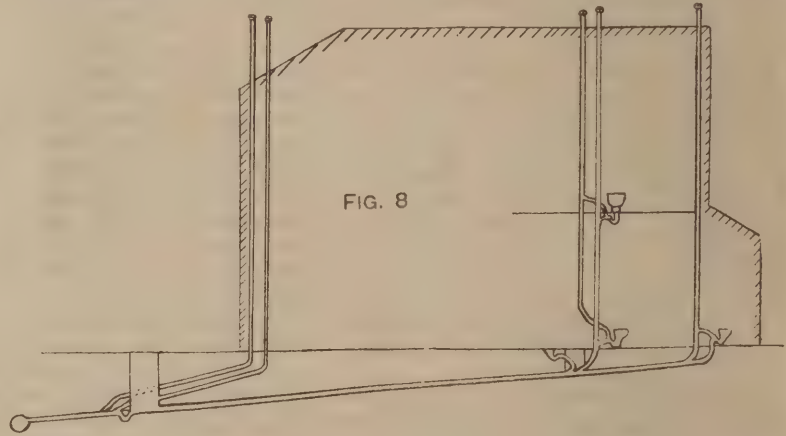


FIG. 8

should be made with rubber, as drain air causes it to perish very quickly. In one drain which it was necessary to open a few weeks after it was laid a 9in. rubber washer which had dropped in accidentally was found to be too rotten to bear its own weight, and broke as a thin strip of putty would when lifted by the middle. With "faced" joints red-lead putty is the best packing to use. When the metal faces of the joint are unplanned, hemp or millboard can be added to compensate for the inequality.

The access doors on the soil-pipe are very useful when any article improperly passes the water-closet trap. I have had to break out a length of iron soil-pipe on account of a stoppage which could not be removed in any other manner, and have found a paint tin, supposed to have been put down by the decorators who were working in the house at the time. An access door on each of the two bends between which the tin was found would have saved much inconvenience and expense. It is quite impossible to account for the manner in which some objects pass the water-closet trap and then remain in the soil-pipe in spite of the weight caused by the accumulation of sewage above them.

The anti-syphonage pipe should be of the same material as the soil-pipe and of corresponding weight. Although a 2in. pipe is large enough to ventilate one water-closet trap, or perhaps two or three, it is not large enough to serve for an indefinite number, as is the English custom. Nor will a 2in. pipe be effective as an anti-syphonage pipe if it is too long. The friction of air in pipes is so great that when the 2in. pipe is, say, 50ft. long the trap is for all practical purposes unventilated, especially if there are any bends in the pipe.

In St. Paul, Minnesota, U.S.A., the "city

accident. In one case of a stopped drain, where the fresh-air inlet was the lowest opening on the drain the sewage poured out with each discharge of a water-closet. Mica flap inlet valves are nuisances of themselves; or rather, as one eminent sanitary engineer said, "They do no good, but they do no harm, because no one ever made one tight." One at least was made tight. It was fixed on the drain of a large house in London. When a water-closet on one of the upper floors was flushed the air driven forward by the falling water had no escape. It therefore became compressed and drove the water out of the trap of the servants' water-closet with such force as to strike the roof of the vault in which it was placed. The plumber was sent for and after sundry experiments removed the mica from the inlet valve. All went well for a fortnight until someone noticed that the mica was gone and forthwith complained of bad smells. The plumber was ordered to replace the mica. He did so and there was immediately a recurrence of the old complaint. He therefore cut off one corner of the mica, just enough to allow the escape of air so as not to force the trap, but not enough to be noticeable. Many more such troubles would occur if air-inlet valves were made air-tight.

Air-inlet valves are not used in America. In exceptional cases both inlet and outlet ventilation pipes are carried up as high as the roof, but in the majority of cases the fresh-air inlet pipes terminate above but near the ground and are unprovided with a valve of any kind. In some cases the pipes open under a grating in the footpath, as shown in Knight's "Annotated Model By-laws." Others can be seen in front gardens or in front areas, with a vent-cap over them (Fig. 13), an arrangement to keep dirt and foreign substances out of the pipe. The

being said about giving sureties. Some discussion followed on the advancing of £100, but eventually plaintiff was able to get an overdraft at the bank, and on June 10th he received the plans and specifications from Mr. Gillam. The next day the latter wrote to the plaintiff saying, "As you cannot find financial security for the job, the other tender will be accepted," and on June 15th sent a further letter informing him that under no circumstances would the contract be given to him. Plaintiff had had bills of quantities prepared, for which, as his tender was accepted, he was to pay 2 per cent. on the amount of the contract, and had engaged a foreman and made other preparations for the work. Had he been allowed to carry out the job he believed he would have made a profit of 15 per cent. Several architects were called as witnesses and they were agreed that the job should have yielded a profit of from 10 to 12 per cent. For the defence Mr. Gillam stated that on June 6th plaintiff signed the agreement but declined to sign the plans and specifications. It was essential, in witness's opinion, that he should have signed them to make the contract binding, because they were a part of it. After the interview with Mr. Maynard, a solicitor, witness told him he could not let him go on, but plaintiff said he could get other gentlemen to finance him and witness said he would draw up a fresh agreement. He did so, but as plaintiff did not find financial security witness advised defendant that the matter would have to drop through. It was a problematical job altogether, and plaintiff might have lost £200 or £300. A Brighton builder eventually carried out the work for £1,750 in addition to the extras, which, witness thought, did not amount to £100. Mr. Justice Grantham found for the plaintiff, and entered judgment in his favour for £120.

THE STRUCTURE OF CEMENTING MATERIALS.*

By W. CARRICK ANDERSON, M.A., D.Sc.,
Lecturer on Metallurgical Chemistry, University of Glasgow.

THERE are certain topics on which one is at times called to speak that present the possibility of making one's story fairly complete. Without assuming that science has reached finality on any single point, there may certainly be said to be matters on which a body of knowledge exists so full and rounded off as to afford a sufficient explanation of daily experience and practice. But there are other questions, and these often not of minor importance, regarding which one may put forward a great deal of information, both useful and painfully won, with the consciousness that it is yet impossible to focus it in such a way as to make out of it a satisfactory solution of the problem with which it deals.

It is with such an unfinished story that I now come before you, and I do so without apology or regret, because I believe that to a society like this, made up largely of practical men keenly interested in the daily solution of practical problems, the narrative will not be unprofitable or pointless, and may fill up a few open spaces in the information of some with material which has not yet found its way into manuals and text-books; and while I am on this point let me safeguard myself from misapprehension. I have not come here to offer any suggestion or guidance as to the use of limes or cements. There are doubtless those present whose practical experience in the working of these materials extends over a lengthy period and has brought them face to face with many points to which my limited practice is a stranger. But it is my business to keep myself apprised of what is being done on such chemical problems by skilled experimenters in different parts of the world, and it is chiefly of the work of these men with reference to this subject of cements that I wish to speak. During the last fourteen years a great deal of valuable research has been done. It is true that the problem of the constitution of the most important cements still remains unsolved, but the reason is the intricacy of the problem itself, and this very intricacy makes it all the more essential that we should gather up the loose ends and know exactly how we stand at the present time.

Cementing Material.

By a cementing material we understand any substance or mixture of substances capable of binding non-coherent matter into a firm, more or less compact whole. The class of such substances includes, at its widest, bodies of the most diverse kind. There are the glues and cements in use for domestic purposes; the various compositions employed for structural work in different connections; those which serve to bind the particles in composition bricks, firebricks, silica bricks, magnesite bricks, &c.; lastly, what we might call the natural cements, which, in the case of freestones and other quarried material, suffice to keep these in a firm coherent state, able to resist for an indefinite period the wasting effects of air and water.

The cementing materials of which I am going particularly to speak are those which are prepared artificially for the use of the builder and the engineer, and especially lime, gypsum, hydraulic limes, Roman, Portland and slag cements.

Forces that operate in the Employment of Cements.

When a body that is chemically homogeneous forms a solid compact mass, the particles are held together by a force which is known as "cohesion." When the solid is a mixture or aggregate of several substances the uniting force is known as "adhesion." In a mass of pure white Carrara marble, which is chemically carbonate of calcium, the particles are firmly united by cohesion. In a mass of granite in which there are usually three constituents chemically distinct, quartz, felspar and mica, we have an example of how powerful a force "adhesion"

may become under certain circumstances. These forces of cohesion and adhesion fix to a large extent the hardness of the material. Cohesion, operating between particles of the same kind, is obviously simple: adhesion is a more variable quantity, being the resultant of several factors. Whether they are in their ultimate essence the same and can be regarded as phases simply of the law of gravitation, we do not need now specially to consider. Certain it is that under suitable conditions they are forces that may become exceedingly powerful, that they become stronger the less the distance between the surfaces that are united, and that they may be regarded (other things being equal) as proportional to the area on which they act.

It is on the employment of these two forces of cohesion and adhesion that the practice of cementing rests. If the cement be a uniform, chemically simple substance, its particles are united to themselves by the force of cohesion; if it is a complexus of substances, cohesion and adhesion will operate conjointly; in either case the substances which are united by the cement are held together by adhesion.

Cohesion, Adhesion and Chemical Affinity.

Cohesion and adhesion are forces which act at distances inconceivably short. If we regard them as manifestations simply of the gravitational energy, which operates with a force which is inversely proportional to the square of the distance, we can readily understand how at excessively minute distances they may become the powerful influences which impart the hardness of granite or of basalt. But there is a force which acts at still shorter distances. This is chemical affinity, which comes into play, for example, when water is allowed to come into contact with a lump of quicklime. In this case the water and the quicklime have been united with a force against which such mechanical forces as tearing, twisting and crushing are powerless, and with an intimacy so close that no microscope can reveal any dividing line between the constituents.

Method of securing Contact.

In order to bring about the most intimate contact between two substances over a maximum area of surface it is necessary that one of them should be a fluid, so that its particles may work their way into the crevices and accommodate themselves to the irregularities of the other if it be a solid—hence the practice of making cementing materials into a paste with water or other suitable medium; while on the other hand since solids have a greater degree of rigidity and hardness than liquids it is imperative that this pasty condition shall not be a permanent one but that, by some subsequent process of hardening, a reversion into the state of solid shall take place.

With these prefatory remarks we may proceed to consider by what mechanism the desired result is brought about in the case of (1) lime, (2) plaster-of-Paris, (3) the class of cements which includes hydraulic limes, Roman, Portland and slag cements.

Lime.

The chemical nature of quicklime is well known. It is made up of a difficultly reducible metal calcium in union with oxygen. In practice it is got by calcination of naturally occurring carbonate of lime, which is found as marble, chalk, limestone, &c. At ordinary temperatures the union between the carbon dioxide, which forms the other constituent, and the lime is a strong one, but as the temperature is raised it is weakened so that at a little over 800° C. (1,472° F.) under ordinary atmospheric pressure it becomes nil. The carbon dioxide goes off and lime or quicklime remains.

Rich or Fat Lime.

Quicklime, when brought in contact with water, combines chemically with it, and the combination, as is well known, is accompanied by a large evolution of heat, amounting to 1,498 calories per gram of the quicklime. There is at the same time a remarkable expansion in bulk. The resulting hydrate may occupy three times the space filled by the original quicklime. The specific gravity of the original quicklime is 3.08 and of the water 1. The slaked lime formed contains 32 grains of water in combination with every 100 grains of quicklime.

100 grams quicklime occupy $\frac{100}{3.08} = 32.5$ c.cs.

32 " water " $\frac{32}{1} = 32$ c.cs.

Total volume occupied by these ingredients - - - = 64.5 c.cs.

Volume occupied by resulting slaked lime (say $2\frac{1}{2}$ times that of quicklime)
= $32.5 \times 2.5 = 81.25$ c.cs.

Original volume of ingredients, 64.5.

Increase of space occupied by 100 grams quicklime after slaking, 16.75 c.cs.

The specific gravity of slaked lime is 2.078, so that the 132 grams of resulting slaked lime occupy only $\frac{132}{2.078} = 63.5$ c.cs. with the actual

matter. Therefore there is an air-space of about 17 c.cs. between the particles.

The result of this is that the cohesive force, previously fairly strong between the particles of quicklime, must of necessity be greatly reduced by slaking. As a matter of fact we know it is reduced to nil, and the product is a loose non-coherent powder.

Hardening of Fat-lime Mortars.

When such fat lime is mixed with sand and water and used as mortar, in course of time the mixture dries and the remainder has little strength or uniting force among its grains. Assuming it to have become thoroughly dry, the only binding forces that hold it together may be considered to be the following:—

Atmospheric Carbon Dioxide.

On the outside the slaked lime fixes some carbon dioxide from the air (in which this gas is present normally to the extent of 3.5 parts in 10,000) and becomes converted into carbonate of lime, which forms a somewhat hard resistant skin or crust. But in the interior such change takes place with extreme slowness and can scarcely be reckoned as an effective agent at all.

Crystallisation of Lime.

Lime however is slightly soluble in water (13.5 parts of slaked lime in 10,000 of water at ordinary temperatures), and as the mixture of water, lime and sand dries up this dissolved lime crystallises out, filling up the interstices of the mass and so promoting adhesion between the separate constituents.

Chemical Action in Fat-lime Mortars.

Sand is frequently said to owe its employment in mortars solely to reasons of economy. But this is scarcely accurate: the superior hardness of the sand grains as compared with those of slaked lime confers strength, and besides the adhesive forces brought into play between the faces of the sand particles and the grains of slaked lime are undoubtedly greater than the cohesive force acting between the lime particles themselves. Over and above these, however, I believe there is another influence which ought not to be left out of account, namely the possibility of chemical action between the grains of sand and the lime brought into solution by the water. At one time it was confidently asserted that chemical action of this sort was largely the cause of the hardening of such mortars. Later it was shown experimentally that in mortars which had been taken from buildings hundreds of years old, and which were perfectly hard and strong, the amount of silicate of lime existing was extremely small, if indeed there was any. Such experimental results led to the abandonment of the view that silicate formation was responsible for the firming of these fat-lime mortars, with the result that the influences I have named above are now credited with the chief part, if not the whole, of the effect. Without denying that this is the case however, I would point out that according to our modern conceptions we can hardly regard the formation of silicate of calcium, at least in the form of an infinitesimally thin surface layer on the face of the sand grains, as non-existent. Such alkaline water as is present in a mixed-up mortar can hardly fail to have some slight superficial action on the sand grains. The amount of silica so influenced may be extremely small, and yet by means of it the adhesive forces may be (and probably are) really reinforced in a considerable degree.

* A paper read before the Scientific Society of the Glasgow and West of Scotland Technical College on February 22nd, 1902.

Gypsum.

Before proceeding to the more complex problems introduced in the employment of lime that is accompanied by other active substances, we may touch for a moment on the behaviour of a well-known substance, plaster-of-Paris.

Gypsum is a naturally occurring substance which has this in common with limestone—it is a compound of the same element, calcium. It differs from the other in containing sulphuric acid, we may say, in place of carbonic acid. As found in nature the stone has a composition that is represented by the chemical formula $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. By this is meant that every complete particle of the substance is built up of a particle of real calcium sulphate, CaSO_4 , in union with two particles of water H_2O . The union which exists between the two parts of this complex particle is not difficult to overcome. Gypsum by moderate heating can be made to part with the whole of the water which is attached to it, and there is left CaSO_4 . When this calcium sulphate CaSO_4 , containing no water in combination, has been prepared it may be placed in the midst of water and shows very little inclination to take up what it has lost. In course of time it does so, but the process is a very slow one. If however the gypsum be heated to temperatures short of that at which complete dehydration occurs (381°F . or 194°C .) its behaviour is somewhat different. It was shown in 1887 by H. Le Chatelier that when gypsum is subjected to the influence of heat it does not lose its combined water all at once, but by stages, and these stages correspond to definite temperatures. At 128°C . (262°F .) it parts with an amount equal to about 15.6 per cent. of its weight, and even when maintained at 155°C . (311°F .) for an hour afterwards the weight was found not to have diminished further. It still retained water equal to 5.2 per cent. of its weight. This remaining 5.2 per cent. it lost when kept at 194°C . (381°F .) for one hour. Afterwards on heating more strongly the weight remained constant. The meaning of these results is that at a temperature above 128°C . and not exceeding 155°C . (311°F .) the body having the chemical formula $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ changes to one having the formula $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$ and at a temperature of 194°C . (381°F .) it becomes CaSO_4 .

When the substance has the composition represented by the formula $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$ it readily resumes possession of the water it has lost when moistened, and passes back to the composition $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. This is the material called plaster-of-Paris, and, as is well known, in resuming the water previously parted with it sets into a firm mass, with considerable expansion. When the gypsum has been thoroughly deprived of the water it was combined with, it shows no such readiness to resume possession. The most probable explanation of this somewhat contrary behaviour is that when the $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$ particle has parted with the water it contains at a temperature of 194°C ., the remaining CaSO_4 combines with itself to form particles which are more complex $(\text{CaSO}_4)_n$ and this union has to be broken before the water can re-enter the molecule. This is a slow and gradual process that can only be effected after a prolonged bombardment of the fortress by the water molecules. Hence "dead-burnt" gypsum only readmits water into union with it after the lapse of a period of time.

The Setting of Plaster-of-Paris.

Le Chatelier's experiments and views have also thrown light on the mechanism by which plaster-of-Paris when it recombines with water forms a firm coherent mass by "setting."

Le Chatelier recalled in this connection an interesting experiment of Marignac, an earlier French chemist. Marignac pointed out that if plaster-of-Paris is shaken with water and the liquid filtered after about five minutes, a solution is obtained which is five times as concentrated as the strongest that can be made from the fully-hydrated sulphate of calcium. But this solution soon after being filtered becomes turbid and deposits crystals of gypsum, so that the concentration in course of time becomes normal. Now this means that the solution which was saturated with the substance $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$ has more than it can carry when this body becomes $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, and crystallisation ensues. When plaster is mixed to a paste

with say 30 to 35 per cent. of its weight of water, this water will proceed to dissolve its complement of the body $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$. This in time hydrates itself to $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ and the water being then more than saturated deposits crystals. But since there is present a large excess of the plaster undissolved, the water is continually replenished with the body $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$, which in turn becomes hydrated and forms crystals of $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$.

The process (with a sufficiency of water) is a continuous one and goes on till the whole of the plaster has passed into the fully-hydrated condition. The result is a mass of crystals which interlace with one another and bind themselves into a fairly firm solid body.

Keene's Cement and Parian Cement.

Regarding the structure and behaviour of the special plaster cements known by such names as "Keene's" and "Parian" I do not dwell, for the reason that while theories have been advanced to explain their action, these do not yet, I believe, rest on a sufficiently sound experimental basis to make it worth our while to spend time on them just now.

Keene's cement is made by steeping the calcined gypsum in a strong solution of borax and cream of tartar (1 part borax and 1 part cream of tartar in 18 parts of water). When it has become thoroughly impregnated, it is taken out, dried and reburnt at a temperature of dull redness for six to eight hours. Borax alone is said to give equally good results, and the stronger the solution the slower the ultimate set.

For Parian cement an intimate mixture of gypsum and dried borax is calcined and afterwards finely ground.

Hydraulic Cementing Materials.

This class of substances is made up of those which will set and harden even in the midst of water. It includes the hydraulic limes, Roman cement, Portland and slag cements.

All limestones are not composed of calcium carbonate in a state of even approximate purity. As a rule they contain more or less clayey matter associated with the carbonate, and in some limestones this is present in considerable quantity. Such clayey matter when present will not be without effect in the calcining process. We have seen that when pure calcium carbonate is heated to a high enough temperature pure calcium oxide or quicklime is left.

In chemical composition clay is a complex body. It is made up of an acid part, silicic acid, and this is combined with alumina and with lime, magnesia and potash, singly or collectively. Two bases are usually present, of which alumina is one. Alumina, the oxide from which aluminium is prepared, is a body of an interesting character. Perhaps its most important feature is its versatility. According to circumstances it will play the part either of a base or of an acid. It is always apparently sitting on the fence: if no other base is present it is ready to act as a base; if a strong active base makes its appearance, alumina is quite ready to discharge the functions of an acid towards it. Keeping this in view we can imagine what will happen when clay which is present in a limestone is subjected along with the accompanying calcium carbonate to the calcining process. At a certain temperature the carbon dioxide of the limestone begins to go off, and this result is stimulated by the co-operation of the silicic acid present, so that it usually takes place at a lower temperature than is the case with a pure limestone. The quicklime being a more powerful base at once begins to oust the alumina from its combination with the silicic acid and silicates of lime are formed. The alumina then, not liking its position of "splendid isolation" and having no acid to ally itself with, combines with the calcium oxide to form aluminates of calcium in which it behaves as an acid. There are several silicates of calcium capable of being formed, and there are also several aluminates of calcium with different proportions of the base in them; consequently we can understand that variation in the amount of clay, and even variation of temperature, may give rise to different products and so to difference in behaviour on the part of the resulting material. To ensure complete union between lime and silicic acid a very high temperature is required, and the same holds true of the formation of aluminates. Temperatures short of this

will produce intermediate products. If the amount of clay is small in proportion to the lime, a balance of the latter will remain uncombined with silicic acid and alumina, and on treatment with water will slake in the ordinary way. Low-temperature calcination generally produces quick setting.

Application of Principles to Hydraulic Limes.

The hydraulic limes are natural limestones in which more or less clayey matter is present. If the percentage of clay is from 5 to 10 per cent the material after calcination at a moderate temperature still slakes strongly after a few minutes: with 15 to 20 per cent. of clay the slaking takes place gently and after a lapse of time; with 20 to 30 per cent. of clay slaking is slight and only after a long period. If burned at a higher temperature, up to the point at which there is incipient vitrification, the masses will not readily undergo change on contact with water. They are then said to be "overburnt" or "clinkered." A good hydraulic lime would be produced by calcining at a moderate temperature a clayey limestone in which the calcium carbonate is present to the extent of from 72 to 92 per cent. Artificial mixtures of limestone and clay containing these proportions are also hydraulic when calcined at a similar temperature. Fine grinding of such hydraulic limes will enable the slaking and setting to go on simultaneously, instead of the former being continued after the latter has already conferred a degree of rigidity on the mass, with consequent straining and perhaps rupture of the whole.

Roman Cement.

This substance, which at one time was largely made in this country, was got by calcining nodules of a limey clay occurring in the London clay. As a rule they contain from 30 to 40 per cent. of clayey matter and are usually highly ferruginous. It was also manufactured (and still is to some extent in the neighbourhood of Glasgow) from clayey limestones belonging to the carboniferous formation. Calcined at a low temperature, not sufficient to completely expel all the carbon dioxide, and then finely ground, the material sets very rapidly with water to form a hard mass of moderate strength. If the temperature of the kiln be not very carefully regulated such highly argillaceous mixtures are apt to fuse readily and then give a very slow-setting product. This is particularly the case when much iron is present.

Composition of Boulogne Cement.

	Per cent.
Silica -	14.27
Alumina -	5.81
Iron -	5.97
Magnesia -	.67
Manganese -	.83
Lime -	46.20
Loss of calcination (H_2O and CO_2) -	26.25
	100.00

Summary.

From the behaviour of hydraulic limes and Roman cements we learn that—

- (1) If the proportion of clay is low and the degree of temperature moderate, the result will be an hydraulic lime, the lumps of which are capable of slaking and will then go through a process of hardening. They never become very strong.
- (2) If the proportion of clay is low and strong heating is applied, no slaking will take place when the calcined stone is placed in water. It is "overburnt." After being finely powdered it would gradually undergo setting. Later, a part of the lime might undergo slaking, leading to disruption or "blowing."
- (3) If the proportion of clay is high and the heating is moderate, then on grinding the mass a rapid setting will take place, as is seen in the so-called Roman cements. If the temperature of calcining is high, a mixture of quicklime and cement, or a slow-setting cement alone, may be produced. Where, as is frequently the case in natural stones containing a high percentage of clay, iron is in large proportion, fusing readily takes place and the resulting glass reacts very slowly with water.

Portland Cement.

Experience in the working of the substances already mentioned led in time to the endeavour

to prepare suitable artificial mixtures of lime and clay and firing these to the proper temperature. This stage in the history of cements was reached in 1824 when Aspdin of Leeds patented his method for an "Improvement in the modes of producing an artificial stone." In it we see the outline of the present-day process of making Portland cements, for he takes powdered limestone and "a specific quantity of argillaceous earth or clay" and mixes them to an impalpable paste with water, dries this in a pan, and calcines, afterwards grinding to a fine powder.

Examples of materials used to-day (Butler):—

Medway Chalk.		Medway Mud.		Cement.	
	Per cent.		Per cent.		Per cent.
Loss at 212° F.	40	Water	4.30	Loss at 212°	20
Insoluble silicious matter	3.45	Organic matter	7.49	" " red heat	2.20
Silica	65	Silica	54.80	Silica	22.80
Alumina and oxide of iron	3.35	Alumina	14.40	Alumina	6.49
Carbonate of lime	92.23	Oxide of iron	8.10	Oxide of iron	4.31
		Carbonate of lime	4.64	Lime	61.10
		Carbonate of MgO	3.50	Magnesia	47
	100.08	Sulphuric acid	1.69	Sulphuric acid	1.71
		Alkalis	75	Alkalis	30
			99.67		99.58

In modern practice the mixture of chalk and mud is calcined to the point of incipient fusion. Experience in the manufacture and use of Portland cements has in course of time fixed upon a very definite proportion of the three principal ingredients, lime, silica and alumina, as that which will give the strongest, most reliable and most durable cements. The lime varies between 61 and 65 per cent. as a rule; the silica is nearly always over 20 per cent., and the average is about 21 per cent.; alumina is usually between 6 and 7 per cent., with a variable quantity of oxide of iron, which, reckoned as alumina, might bring it up to about 11 per cent. Increase or decrease in the proportion of the alumina and iron, other things being the same, usually results in increased or diminished rapidity of setting (see analyses to be published next week).

Slag Cements.

The ingredients necessary in the cements we have mentioned, hydraulic limes, Roman cement and Portland cement, are in kind the same as go to make up ordinary blast-furnace slags, namely, lime, alumina and silica; except that as a rule the proportion of lime in these latter is less than in the Portland cements. Thus an ordinary Scotch blast furnace slag might have the proportions—

	Per cent.
Silica	30
Alumina	20
Lime	38
Magnesia, iron oxide, &c.	12
	100

Some blast-furnace slags are however considerably richer in lime, and many of these if run molten into water and so granulated are found afterwards to possess notable hydraulic properties. In other cases the "slag sand" produced in this way is mixed intimately with lime, say in the proportions 3 of slag to 1 of lime, and the result is a cement of very good quality and strength.

The following figures show the composition of a German slag cement ("Königshofer")—

Slag used.		Lime (ignited).		Finished Cement (Tetmajer).	
	Per cent.		Per cent.		Per cent.
Silica	26.29	SiO ₂	12.42	Silica	21.23
Calcium oxide	49.16	CaO	81.55	Alumina	12.57
Alumina	18.71	Al ₂ O ₃	2.62	Ferric oxide	90
Magnesia	2.45	MgO	1.75	MnO	trace
Ferrous oxide	1.80	Fe ₂ O ₃	88	Calcium oxide	55.50
Manganese oxide	24	MnO	trace	Sulphur trioxide	1.72
	98.65	Na ₂ O	21	Sulphur	70
		CO ₂	19	Magnesia	2.93
		H ₂ O	43	Carbon dioxide	65
			100.05	Water	2.41
					98.61

The following analysis of a slag cement I take from Mr. Redgrave's book—

Slag Cement.

	Per cent.
Lime	39.68
Silica	24.34

Alumina	8.74
Protoxide of iron	27
" " manganese	23
Peroxide of iron	14
Magnesia	6.59
Potash	28
Soda	44
Sulphur	93
Sulphuric acid	25
Carbonic acid (as carbonate of lime CaO 2.28 : CO ₂ 1.79)	4.07
Water and loss	4.70

100.66

In connection with its chemical composition we have to keep in remembrance the fact that it has been subjected to a temperature sufficient to bring about complete fusion, and that when liquid it is run direct into water and so suddenly chilled. Portland-cement clinker has only, as we have seen, been raised to a temperature sufficient to bring about sintering.

Structure of these Cements.

We are now in a position to study the researches which have been conducted during recent years with a view to throwing some light upon the structure and behaviour of these bodies.

The first to make a real advance in this direction was Le Chatelier, who in 1887 published an elaborate paper on the subject. His method was a twofold one, microscopical examination of the Portland-cement clinker and set cement, and synthetic preparation of the bodies supposed to constitute these, with a view to studying their properties.

Le Chatelier's Investigations.

Cement clinker he finds is a composite substance, and in thin sections is seen to be made up of constituents some of which are active and others inactive to polarised light. To separate them from one another appeared to be impossible, hence he was led to try to construct bodies of like physical and chemical behaviour out of the elements which are contained in the clinker.

(1) A proportion of the clinker is inactive to polarised light. The substance having the formula $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ crystallises in cubes he finds, and hence is optically inactive.

(2) A second substance which is present has weak optical activity with well-defined crystalline form. It is the chief constituent of Portland cement, and he believes it is a silicate of lime with the formula $3\text{CaO} \cdot \text{SiO}_2$.

(3) This silicate is crystallised in a matrix of a deep-brown colour which is optically active, and more fusible than either of the previous ones. This Le Chatelier conjectures may be an aluminoferrite of lime with the formula $2(\text{AlFe})_2\text{O}_3 \cdot 3\text{CaO}$. He was able to produce

on to examine these with particular reference to their action on water.

Aluminates.

Mono-aluminate.— $\text{CaO} \cdot \text{Al}_2\text{O}_3$; nearly infusible; sets rapidly with water.

Di-aluminate.— $2\text{CaO} \cdot \text{Al}_2\text{O}_3$; rather fusible; sets quickly with water like plaster, but the mass afterwards falls to pieces on boiling with water.

Tri-aluminate.— $3\text{CaO} \cdot \text{Al}_2\text{O}_3$; very fusible and sets quickly with water.

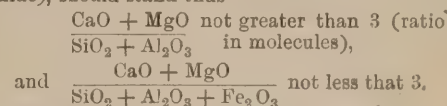
Silicates.

Mono-silicate.— $\text{CaO} \cdot \text{SiO}_2$; is not acted on by water and therefore can play no part in the hardening of cement.

Di-silicate.— $2\text{CaO} \cdot \text{SiO}_2$; is formed by heating chalk and powdered quartz in the right proportions in a crucible; it falls to pieces on cooling, like overlaid cement clinker. This spontaneous pulverisation is due, Le Chatelier believes, to a change in crystalline form.

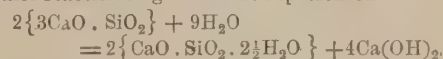
Tri-silicate.— $3\text{CaO} \cdot \text{SiO}_2$; cannot be got by heating silica with 3 molecules of lime, a mixture of lime and lower silicates being always obtained. Le Chatelier believes however that this tri-silicate may be formed indirectly by heating lime and fusible silicates and is the chief active constituent of hydraulic mortars.

On the assumption that the tri-aluminate and tri-silicate of lime are the chief constituents in cement clinker, Le Chatelier formulates the rule that in the mixture to be calcined for cement making, the proportion between bases, represented by lime and magnesia, and acids, represented by silica and alumina (and iron oxide), should stand thus—



Composition of Set Cement (Le Chatelier).

In the set cement, according to Le Chatelier, the structure is made up of hexagonal plates of white crystallized calcium hydrate, $\text{Ca}(\text{OH})_2$, embedded in a white mass of interlaced needle-shaped crystals of a hydrated calcium mono-silicate having the formula $\text{CaSiO}_3 \cdot 2\frac{1}{2}\text{H}_2\text{O}$. The chief reaction might thus be represented—



Investigations of Messrs. Newberry.

These researches of Le Chatelier were followed up and extended by Messrs. S. B. & W. B. Newberry, of New York, who published their results in 1897.

The points on which they specially sought information were—(1) What proportion of lime must be employed for given percentages of silica and alumina in a clay? (2) Can a general formula be stated, applicable to all clays, which will indicate the proportion of lime to give the best result with each?

As a preliminary step to answering these questions Messrs. Newberry repeated Le Chatelier's experiments of making and examining the pure silicates and aluminates of lime with the results as described on the next page.

Conclusions.

From these results Messrs. Newberry draw the following conclusions:—

(1) Lime may be combined with silica in the proportion of 3 molecules to 1 and still give a product of practically constant volume and good hardening properties, though hardening very slowly. With $3\frac{1}{2}$ molecules of lime to 1 of silica the product is not sound, and cracks in water.

(2) Lime may be combined with alumina in the proportion of 2 molecules to 1, giving a product which sets quickly but shows constant volume and good hardening properties. With $2\frac{1}{2}$ molecules of lime to 1 of alumina the product is not sound.

Application of these Results.

The data thus obtained, it is suggested, may be made use of to gauge the amount of lime that may be safely used with a clay of any known composition. The most basic silicate of lime that can exist in a good clinker being that which has the formula $3\text{CaO} \cdot \text{SiO}_2$, and the most basic aluminate being $2\text{CaO} \cdot \text{Al}_2\text{O}_3$, the most highly limed clinker will have the general formula

such a body with the required properties. It is slowly acted on by water, and does not contribute much to the setting power of the cement.

Proceeding on the assumption that aluminates and silicates of lime constitute the principal constituents of Portland cement, Le Chatelier went

Silicates.

	Formula.	Ratio $\frac{\text{CaO}}{\text{SiO}_2}$	Per cent. CaO.	Per cent. SiO ₂ .	Pat Test.	Hot Test. ²
1	2CaO . SiO ₂ -	1.83	65.11	34.89	Set hard; hard at seven days; hard at six weeks.	Sound; on glass; hard.
2	2½CaO . SiO ₂ -	2.33	70.00	30.00	Set soft; fair at seven days; hard at six weeks.	Ditto.
3	3CaO . SiO ₂ -	2.80	73.63	26.32	Same as 2 - -	Ditto.
4	3½CaO . SiO ₂ -	3.27	76.56	23.44	Cracked; soft; hard at six weeks.	Ditto.

Aluminates.

	Formula.	Ratio $\frac{\text{CaO}}{\text{Al}_2\text{O}_3}$	Per cent. CaO.	Per cent. Al ₂ O ₃ .	Pat Test.	Hot Test.
1	2CaO . Al ₂ O ₃ -	1.10	52.33	47.62	Set quick; hard; sound at six weeks.	Sound; on glass; fairly hard.
2	2½CaO . Al ₂ O ₃ -	1.37	57.85	42.15	Set quick, curved and cracked.	Curved and cracked; soft.
3	3CaO . Al ₂ O ₃ -	1.65	62.23	37.77	Ditto - - -	Ditto.

² The pairs after testing overnight were exposed for four to five hours to steam at 90° C.

X (3CaO . SiO₂) + Y (2CaO . Al₂O₃), X and Y being the numbers of molecules of silicate and aluminate respectively.

In 3CaO . SiO₂ the ratio of lime to silicate is 2.8 : 1.

In 2CaO . Al₂O₃ the ratio of lime to alumina is 1.1 : 1.

therefore for 100 parts of clay the lime required will be—Per cent. of silica × 2.8 + per cent of alumina × 1.1.

It is to be noted however that the result so obtained is the theoretical maximum, only safe in practice with the very finest grinding of the clinker.

Oxide of Iron in Portland Cements.

To the question, what part is played by ferric oxide in the setting of cements, Messrs. Newberry's experiments lead them to give the answer that it is able to replace alumina and take its part in promoting the reaction between silica and lime.

Alkalis.

These experimenters conclude on the other hand that alkalis have no important part to play in the formation of cements.

Magnesia.

This element, which has been for long the centre of controversy among workers in cements, possesses hydraulic properties when heated alone. According to Messrs. Newberry it does not form hydraulic compounds with silica, alumina or clay. It is incapable of replacing lime in cement mixtures.

The carefully conducted researches of Messrs. Newberry mark a distinct advance in the chemistry of hydraulic cements, and we may take the limits which they suggest as really representing the maximum of lime which it is in practical work dangerous to approach and probably fatal to overstep.

O. Rebuffat.

In 1899 a well-known Italian expert on the chemistry of cements put forward his views on the structural arrangement of these materials, which may be summarised shortly thus:—

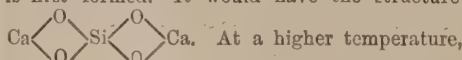
Hydraulic cements are divisible into two groups—(1) Non-crystalline, compact cements such as hydraulic limes and quick-setting (Roman) cements. These are composed of orthosilicate of calcium Ca_2SiO_4 and calcium aluminate, with lime in addition in certain cases. (2) Crystalline cements, such as Portland and silicious cements. These are composed of a crystalline compound of lime and orthosilicate of calcium and an aluminate of calcium in varying proportions. The aluminate is usually mono-aluminate; he believes in opposition to Le Chatelier's conclusion that it is the tri-compound $3\text{CaO} \cdot \text{Al}_2\text{O}_3$, a body which however, as we have seen, Messrs. Newberry hold is unsound in water. Along with the orthosilicate and lime compound, there is present also in cements high in silica a quantity of the calcium metasilicate $\text{CaO} \cdot \text{SiO}_2$.

The Setting Process according to Rebuffat.

The chemistry of the hardening process, according to Rebuffat, consists simply in the hydration of the calcium orthosilicate with production of a body having the composition represented by the formula $2(\text{SiO}_2 \cdot 2\text{CaO}) \cdot \text{H}_2\text{O}$. Hydration of the calcium aluminate takes place at the same time. The calcium oxide in combination with the calcium orthosilicate is set free in the hydration process, and forms calcium hydrate which crystallises. The metasilicate, which is present in highly silicious cements, does not hydrate, but enters into combination with the calcium aluminate, forming double compounds with it (double silicates of calcium and aluminium). To this latter combination Rebuffat ascribes the superior power which such highly silicious cements undoubtedly have to resist the action of sea-water.

Zulkowski.

On this part of my subject I shall refer to the work of only one more investigator, K. Zulkowski, published in 1899 and last year. Zulkowski lays stress upon a fact which previous writers have usually overlooked or regarded as of minor importance. We have seen that in the modern industry of slag-cement making it is found necessary to rapidly cool the molten slag by granulating in cold water. If the slag be not quickly chilled it will be found deficient in hydraulic properties, and may even be altogether devoid of them. If slowly cooled, such a slag will frequently fall to a loose grey powder. A similar phenomenon is not unknown in the Portland-cement works, and is called the "dusting" of cement clinker. Such changes, resulting in a difference of property, obviously proceed from some alteration of structure in the material, seeing that the chemical composition remains the same, and may be ascribed to dimorphism of some compound or compounds in the slag or clinker. In his latest paper (Chem. Ind., 1901, 21 [10] 290, &c.) Zulkowski expresses the view, based on a long series of experiments, that this dimorphism is manifested by the silicates of calcium of the general formula Ca_2SiO_4 . When two molecules of lime and one of silica are heated together, the orthosilicate is first formed. It would have the structure



According to Le Chatelier

" " Newberry

" " Rebuffat

" " Zulkowski

$\text{SiO}_2 \cdot 3\text{CaO}$
(tri-calcium silicate)

$\text{SiO}_2 \cdot 3\text{CaO}$
(tri-calcium silicate)

$\text{SiO}_2 \cdot 2\text{CaO} + \text{nCaO}$
(crystalline compd. of calcium orthosilicate and lime)

$\text{SiO}_2 \cdot 2\text{CaO} \text{ \& \; CaO in excess}$
(basic calcium metasilicate and lime)

and

$\text{Al}_2\text{O}_3 \cdot 3\text{CaO}$
(tri-calcium aluminate).

and

$\text{Al}_2\text{O}_3 \cdot 2\text{CaO}$
(di-calcium aluminate).

and

$\text{Al}_2\text{O}_3 \cdot \text{CaO}$
(calcium mono-aluminate).

and

$\text{Al}_2\text{O}_3 \cdot 2\text{CaO}$
(dicalcium aluminate).

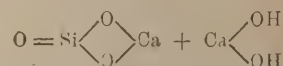
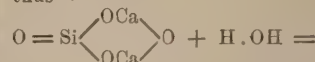
namely, that at which the mixture melts or even softens, this body rearranges itself to form

basic calcium metasilicate $\text{O}=\text{Si} \begin{array}{c} \diagup \quad \diagdown \\ \diagdown \quad \diagup \end{array} \text{O}$.

This basic calcium metasilicate is a powerful hydraulic. If the pasty or fluid mass be chilled by pouring suddenly into cold water (granulation) it remains, and the product is hydraulic. If, on the other hand, the cooling process is a gradual one, the basic metasilicate changes once more into the orthosilicate, which is without action as a cement. The orthosilicate is crystalline and the strains resulting from the crystallisation of the substance as it is formed cause the disintegration of the whole mass. This powdery material is found to be destitute of any hydraulic quality whatsoever.

The Setting Process according to Zulkowski.

When the basic metasilicate, according to this experimenter, is brought in contact with water it undergoes decomposition with formation of monocalcium silicate and calcium hydrate, thus—



In the alkaline liquid so produced the monosilicate swells up, and the increase of volume causes the binding to take place.

Composition and Structure of Portland-Cement Clinker according to Zulkowski.

Portland cement, in which, according to Le Chatelier, the principal constituent is tricalcium silicate, $3\text{CaO} \cdot \text{SiO}_2$, Zulkowski holds to be mainly composed of a mixture of dicalcium orthosilicate $\text{Ca} \begin{array}{c} \diagup \quad \diagdown \\ \diagdown \quad \diagup \end{array} \text{Si} \begin{array}{c} \diagup \quad \diagdown \\ \diagdown \quad \diagup \end{array} \text{Ca}$ basic calcium meta-

silicate $\text{O}=\text{Si} \begin{array}{c} \diagup \quad \diagdown \\ \diagdown \quad \diagup \end{array} \text{O}$ and free lime CaO .

The tricalcium silicate of Le Chatelier he believes to be non-existent.

In support of his theories regarding the structure and setting of Portland cement, Zulkowski experimented on a sample from Stettin. From the analysis he was led to assume for the body the following composition:—

	Per cent.
Sodium silicate (with some potassium silicate) - - - -	3.43
Calcium sulphate - - - -	2.45
$\text{SiO}_2 \cdot 2\text{CaO}$ - - - -	61.89
$\text{Al}_2\text{O}_3 \cdot 2\text{CaO}$ - - - -	12.14
$\text{Fe}_2\text{O}_3 \cdot 2\text{CaO}$ - - - -	4.35
MgO - - - -	.97
CaO - - - -	14.22
	99.45

According to the author's views such a cement ought to fix 14.67 per cent. of water of hydration. The experimental results obtained were—

	Per cent.
In one day - - - -	4.30
" two days - - - -	6.47
" seven days - - - -	11.32
" twenty-one days - - - -	14.44
" thirty days - - - -	14.44

Summary.

Comparing the views of the authorities we have named, and whom I have taken as far as possible in chronological order, we find the following state of matters.

Portland-cement clinker is composed, according to all of them, of silicate and aluminate of calcium chiefly. The composition of these bodies is represented by the formulae below.

Put alongside one another, the views represented are not so divergent as would appear at

first sight to be the case. They all indicate that lime is present in excess of that required to form $\text{SiO}_2 \cdot \text{CaO}$. The earlier experimenters, Le Chatelier and Newberry, regarded that excess as being in combination, giving tri-calcium silicate. Rebuffat looks upon it as in the condition of a loose compound with $\text{SiO}_2 \cdot 2\text{CaO}$, capable of being decomposed by water. Zulkowski regards the excess as actually free lime in variable quantity. This latter view is probably the correct one; unfortunately there is as yet no reliable means at our disposal for differentiating between this really free lime and that existing as an unstable basic compound of silica. The substance $\text{SiO}_2 \cdot 2\text{CaO}$, which is active, Zulkowski calls basic calcium metasilicate, and is able to explain by its dimorphism with the calcium ortho-disilicate the results which follow from the granulation of slag cement and the "dusting" of Portland clinker.

With regard to the formula for the aluminate, the balance of evidence appears to be in favour of that given both by Newberry and Zulkowski, $\text{Al}_2\text{O}_3 \cdot 2\text{CaO}$.

Set Cement.

Regarding the composition of the set cement we have the views of Le Chatelier, Rebuffat and Zulkowski. According to the first and third the set cement has as its chief constituents calcium monosilicate, calcium hydrate and calcium aluminate. According to the one the monosilicate is hydrated ($2\{\text{CaO} \cdot \text{SiO}_2 \cdot 2\frac{1}{2}\text{H}_2\text{O}\}$), according to the other no water is combined with it. Rebuffat views the principal part of the set cement as hydrated calcium orthosilicate $2(\text{SiO}_2 \cdot 2\text{CaO})\text{H}_2\text{O}$.

Effect of Gypsum on Hydraulic Cements.

Before concluding this sketch of the chemistry of hydraulic cements I must deal shortly with the questions that arise in connection with the addition of calcium sulphate to such cements and the effect upon them of waters containing this substance in solution. The discovery that important results follow from the addition of plaster-of-Paris to hydraulic cements dates back to 1854, when the matter was investigated by General Scott, who, two years later, patented his selenitic cement in which 5 per cent. of plaster-of-Paris was intimately mixed with calcined hydraulic lime. One of the most important effects of adding calcium sulphate is to delay the setting of the cement. One per cent. of plaster-of-Paris thus intermixed has been found to delay the time of setting from five to seven hours. In consequence of this, gypsum is now largely used in quantities up to about 2 per cent. for the purpose of regulating the time of setting to any desired length. The experiments of Dyckerhoff, too, show that there is an appreciable gain in strength when from $\frac{1}{2}$ to 2 per cent. of gypsum is added to the cement. Lightly-burned cements are much more powerfully influenced by such additions than heavily-burned cement, which needs a larger addition of gypsum to effect the same result. Another point of interest is that a cement which has been made slow-setting by addition of gypsum can again be made quick-setting by aeration.

Candlot's Experiments.

In connection with the selenitic action Candlot has made some experiments of great interest. He found that when a cement to which gypsum has been added is gauged with water, calcium sulphate is found at first in the water with only a little free lime. After three hours the free lime in solution has increased and the gypsum has fallen to nil. From these results Candlot concluded that something in the setting cement was forming an insoluble compound with the gypsum. He then found that calcium aluminate of the formula $\text{Al}_2\text{O}_3 \cdot 5\text{CaO}$ behaved in the same way towards gypsum as the cement did, and thereafter he succeeded in isolating a crystalline compound formed by the two and having a composition corresponding to the formula $\text{Al}_2\text{O}_3 \cdot 3\text{CaO} \cdot 2\frac{1}{2}\text{CaSO}_4 \cdot 6\frac{1}{2}\text{H}_2\text{O}$. This body is difficultly soluble in water and insoluble in lime water. The formation of this body according to Candlot explains why it is that a cement which has been rendered slow-setting by gypsum regains its quick-setting property on aeration. All cements contain a small quantity of free lime. This dissolves in the water used for gauging, and in the lime water so formed the calcium aluminate is insoluble. The calcium

sulphate also dissolves and further decreases the solubility of the aluminate. By aeration the free lime is converted into carbonate; then on gauging the aluminate and the gypsum dissolve together and react with mutual precipitation and so the setting takes place rapidly.

If the free lime in a cement containing no calcium sulphate be removed by gauging with a weak solution of sodium carbonate (0.2 per cent.), the setting time may be reduced from two hours to three minutes. Conversely a gypseous cement that has become quick-setting by aeration may again be made slow-setting by addition of a little lime. With Portland cements the formation of the double compound may not become complete during setting and the result may be "blowing" if much gypsum is present.

Michaëlis.

Michaëlis has described a body similar to that made by Candlot under the title of the "cement bacillus" to which he gives the formula $\text{Al}_2\text{O}_3 \cdot 3\text{CaO} \cdot 3\text{CaSO}_4 \cdot 30\text{H}_2\text{O}$.

This body occupies a much larger space than the aluminate and sulphate which enter into its composition and hence, when formed in quantity, owing to much gypsum being present, it causes "blowing." The greater bulk it occupies explains however why it is that a limited addition of calcium sulphate gives increased closeness of texture and greater tensile strength to a cement.

F. Schott.

These conclusions are largely borne out by the experiments of Schott, of which the following may be quoted. Two cements, which we shall call "A" and "B," were prepared. "A" consisted solely of lime and silica in the proportions necessary to form the compound $\text{SiO}_2 \cdot 2\text{CaO}$. "B" contained alumina to an extent similar to an ordinary commercial cement. Its percentage composition was—Silica 18.09; alumina 12.53; ferric oxide .90; lime 63.30; magnesia .96; sulphuric anhydride .71; loss on ignition 3.73; total = 100.22. Samples of these cements were gauged with water both with and without addition of gypsum. The quantity of gypsum added was reckoned so as to form the double compound $\text{Al}_2\text{O}_3 \cdot 3\text{CaO} \cdot 3\text{CaSO}_4 \cdot 30\text{H}_2\text{O}$ of Michaëlis, with the whole of the aluminate present. "A" set firmly under both sets of conditions and with practically no expansion. "B" when gauged with pure water showed the usual expansion of Portland cements, and when treated with gypsum expanded violently and broke up. A cement prepared according to the formula $2\text{CaO} \cdot \text{Al}_2\text{O}_3$ when gauged alone expanded considerably, and when gypsum was added showed a still stronger expansion, resulting in cracking without disintegration. Another cement in which ferric oxide was made to replace alumina, and having the composition—

	Per cent.
Silica - - - - -	26.10
Ferric oxide - - -	12.90
Lime - - - - -	61.60
	99.9

hardened perfectly without blowing when gauged alone, but on addition of gypsum showed strong expansion. Gypsum would thus appear to exert a similar influence on calcium ferrite to what it has on calcium aluminate.

Klinkenburg.

Klinkenburg has confirmed the statements of Candlot and Michaëlis, that calcium sulphate combines with the aluminates of lime to form compounds containing a very large proportion of combined water.

Effect of Sea-Water on Portland Cement Explained.

According to Michaëlis (Proceedings Institute of Civil Engineers 1896-7) the formation of this calcium aluminate-sulphate takes place very freely when Portland-cement mortar hardens in sea-water. When Portland cements are passing through the hardening process they undergo decomposition with separation of calcium hydrate, which crystallises throughout the mass. When the hardening takes place in sea-water the excess of lime is converted into sulphate and ultimately into silicate. The sulphate of calcium thus formed combines with the calcium aluminate and assimilates from thirty to sixty equivalents of water with such increase in bulk as to seriously affect the cohesion of the mass. Roman cements, according to this authority, on account of their having a smaller proportion of lime, form under these conditions

more stable compounds, and from a chemical point of view constitute the best hydraulic mortars. A smaller amount of the double salt is formed, and it finds enough room for expansion in the pores of the mortar. Being burnt at a low temperature, however, these cements are deficient in density, and mortars made from them shrink on exposure to air.

Protection afforded by Addition of Trass.

To Portlands from which about 33 per cent. of calcium hydrate would be segregated Michaëlis advises the addition of trass or similar substances rich in silica (say 125 parts of trass to 100 of Portland) which would combine gradually with the free lime and so render the mortar more stable in sea-water.

M. Deval on the preparation of Sulpho-Aluminate.

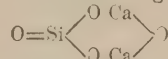
The most recent experimenter on the sulpho-aluminate of calcium is M. Deval, and his results, published in 1900 (Bull. de la Soc. d'Encour., 1900, 5 [1], 49-54), have still further defined the nature and composition of the body. He has shown that it can be prepared from sulphate of alumina and calcium hydrate, and also from tri-calcium aluminate and sulphate of lime. The resulting body had the same composition in each case, and this agreed with the formula $\text{Al}_2\text{O}_3 \cdot 3\text{CaO} \cdot 3\text{CaSO}_4 \cdot 28\frac{1}{2}\text{H}_2\text{O}$, which is in close agreement with that given by Michaëlis.

Summary.

I shall now attempt to sum up the position in which I believe we at present stand in relation to the chemistry of these hydraulic cements.

(1) Investigation has been chiefly directed to the class of Portland and slag cements, that is to say, those in which the raw materials have been heated to the point of incipient or actual fusion. Such cements, as well as the hydraulic limes and Roman cement, consist almost certainly of silicates and aluminates of calcium with, in many cases at least, some excess of lime.

(2) The silicate of calcium, which is the predominating constituent in Portland and slag cements, has the general formula Ca_2SiO_4 . An excess of lime, which is present, at least in all Portland cements, exists either free (Zulkowski) or in loose combination with the silicate (Rebuffat). Two compounds exist corresponding to this general formula, only one of which has hydraulic properties. To it Zulkowski gives the structural formula



and the name basic calcium metasilicate. The other he regards as the orthosilicate with the structural formula



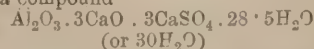
(3) The aluminate is either the mono- or di-aluminate of calcium, most probably the latter.

(4) In the setting process the excess lime, whether it is free or in a state of loose combination, slakes, dissolves in the water and crystallises. The basic metasilicate also decomposes with separation of lime, which likewise hydrates (Zulkowski); mono-calcium silicate is at the same time formed and takes part in the setting process, either by hydrating with $2\frac{1}{2}$ molecules of water (Le Chatelier) or by simply swelling up in the alkaline liquid (Zulkowski). The di-calcium aluminate may become hydrated at the same time.

(5) The set cement is mainly composed of calcium hydrate crystals, calcium monosilicate (hydrated or anhydrous) and mono- or di-calcium aluminate, probably also in the hydrated condition. Any ferric oxide present plays the part of its equivalent of alumina.

(6) Various substances dissolved in the water used for gauging have a marked effect on the setting process. Lime and calcium sulphate delay the setting; sodium carbonate, calcium chloride, and magnesium chloride hasten it.

Of the substances mentioned, calcium sulphate has in addition the remarkable property of forming a compound



with the aluminate present. This compound occupies a much larger bulk than the gypsum and aluminate which enter into its composition, and if formed in quantity in a cement may lead to a serious weakening of its cohesion and even cause destruction of the whole mass.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRISTOL.—For the enlargement of the Petty Sessional Courts and Offices in Bridewell Street, Bristol, for the Corporation. Mr. Henry Williams, architect:—
 Stephens & Bastow... £20,880 C. A. Haynes... £19,707
 J. Perkins... 20,070 E. Walters... 19,070
 W. Cowlin & Son... 20,493 R. F. Hidd... 19,590
 A. J. Beavan... 19,900 R. Wilkins & Sons... 18,117
 * Accepted.

CHATHAM.—For extension of St. William's Hospital, and for building a new ward to the small-pox hospital, for the Rochester and Chatham Joint Hospital Board:—
 Viney & Stone... £13,037 Lawrence Seager... £11,290
 J. H. Durrant... 12,990 West Bros... 11,110
 Wallis & Sons... 12,350 H. Phillips... 10,745
 Multon & Wallis... 12,350 C. E. Skinner... 9,350
 W. Coker... 11,478 J. D. Corke... 9,900
 George West... 11,380 * Accepted.

CHISWICK.—Accepted for extension of Carriage Factory, Chiswick, W., for Messrs. Henry Whitlock, Ltd. Mr. T. Wilson, architect, 34 New Bridge Street, E.C.:—
 L. L. Leeder & Co... £1,397

CORK.—For the erection of three houses for Captain Dabner, Summer Hill, South Cork. Messrs. W. H. Hill & Son, architects, Cork:—
 J. E. O'Connell... £1,405
 T. Sisk & Sons... 1,405
 E. Gaul... 1,400
 J. Kerras... 1,325
 Edward Fitzgerald, Geraldine Place... 1,200
 * Accepted.

HAMPSTEAD.—For extension of stables, England's Lane, Hampstead, for Messrs. Richards, Ltd. Mr. T. Wilson, architect, 34 New Bridge Street, E.C.:—
 Thompson... £399 Pugh... £447
 Pearson... 475 Williams... 420
 Littlewood... 478 * Accepted.

HUNSTANTON.—For the erection of new stables, &c. at the Glebe Hotel, Hunstanton. Mr. Herbert J. Green, architect, 31 Castle Meadow, Norwich:—
 W. H. Brown, King's Lynn... £1,719 0 0
 W. Sindall, Cambridge... 1,515 0 0
 John Cracknell, Peterboro... 1,419 0 0
 Geo. Chambers & Sons, Snettisham... 1,411 6 3
 Reuben Shanks, Chatteris... 1,394 0 0
 W. Saint, Cambridge... 1,384 0 0
 A. F. Foreman, King's Lynn... 1,370 12 0
 F. Giddings, St. Ives, Hunts... 1,338 0 7
 * Accepted conditionally.

LONDON.—For improvements at Lucas Street School, Greenwich, for the London School Board. Mr. J. Bailey, architect:—
 F. & H. F. Higgs... £15,247 J. & M. Patrick... £13,306
 W. Downs... 14,707 J. & C. Bowyer... 13,286
 G. E. Wallis & Sons... 14,234 C. Cox... 13,149
 Holliday & Greenwood... 14,834 Kirk & Randall... 12,834
 Ltd... 14,030 J. Smith & Sons, Ltd... 12,597
 J. Garrett & Son... 13,663 Stimpson & Co... 12,400
 E. Lawrence & Sons... 13,570 * Recommended for acceptance.

LONDON.—For adaptation of ambulance steamboat "Red Cross" for conveyance of recumbent patients, for the Metropolitan Asylums Board:—
 Ellyth & Pascoe, 10 London Street, E.C... £1,710 10
 W. S. Needham, 1 Derrick Street, Commercial Road... 1,063 10
 Docks
 W. C. Reeder & Co., 1 Railway Place, Fenchurch Street, E.C... 1,643 15
 * Accepted.

LONDON, E.—For the erection of a warehouse on the south east quay of the Limehouse Basin, for the Regent's Canal and Dock Company. Plans and quantities by Messrs. Thomas & Thomas, Paddington:—
 Putnam & Fotheringham... £7,183 Sheffield Bros... £6,495
 Bull & Edalite... 7,000 W. Johnson... 6,473
 J. E. Johnson & Sons... 6,902 Kirk & Randall... 6,443
 Godson & Sons... 6,924 W. Gladding... 6,388
 Chessum & Co... 6,700 Holliday, Greenwood & Co... 6,387
 J. C. Richards... 6,633 C. J. Lovatt & Co... 6,340
 Perry & Co... 6,661 H. Watts & Co... 6,340
 J. R. Ward... 6,520 Watts, Johnson & Co... 6,157
 * Accepted.

LONDON, N.—For the erection and completion of certain extensions of the works and offices at their electric light station, Coronet Street, N., for the Shoreditch Borough Council. Mr. J. Rush Dixon, A.M.I.C.E., borough surveyor:—
 Johnson & Sons, Leicester... £23,454
 Pollard & Brand, Tottenham, N... 2,700
 H. B. Neal, Plymouth... 2,554
 J. Chessum & Sons, Bow, E... 2,467
 W. Reason, Rosebery Avenue, E.C... 2,390
 J. Kiddle & Sons, Norton Folgate, E... 2,389
 W. H. T. Kelland, Stoke Newington... 2,347
 F. G. Minter, Westminster... 2,312
 J. Smith & Son, Ltd., South Norwood... 2,279
 A. Porter, Tottenham, N... 2,251
 C. Ansell, Lambeth, S.E... 2,250
 H. L. Holloway, Deptford, S.E... 2,230
 Gardner & Hazell, Islington, N... 2,216
 C. Yates & Co., Bow Road, E... 2,199
 Spencer, Sauto & Co., Ltd., Kensyngton, W... 2,251
 Wilson Bros. & Lamplough, Notting Hill, W... 2,050
 * Accepted conditionally.

LONDON, N.E.—For the making up, channelling, kerbing, paving, &c., of Geldeston Road, between Northwood Road and Cazeneve Road, for the Hackney Borough Council. Mr. Norman Scorgie, M.I.C.E., borough surveyor:—
 D. T. Jackson, 104 Ripple Road, Barking... £1,983 11 5
 Williamson & Sons, Green Lanes, Finchbury Park, N... 1,798 0 0
 W. Griffiths & Co., Ltd., 35-39 Hamilton House, Bishopsgate Street Without, London, E.C... 1,717 0 4
 C. W. Killingback & Co., James Street, Camden Town... 1,694 13 8
 G. J. Anderson, 26 North Street, Poplar, N... 1,684 13 8
 Grounds & Newton, Page Green, South Tottenham, N... 1,678 15 2
 T. Adams, Wood Green, N... 1,650 15 2
 G. Porter, 2 Arthur Street, Well Street, Hackney, N.E... 1,631 9 0
 E. P. Bloomfield, 156 West Green Road, Tottenham, N... 1,599 2 3
 W. Gibbs, Ltd., Duke Shore Wharf, Limehouse, E... 1,459 3 9
 * Accepted.

MERTHYR TYDFIL.—For the erection of 100 houses at Pen-y-darren, Merthyr, in connection with a scheme under the Housing of the Working Classes Act, 1890, for the Merthyr Tydfil Urban District Council:—
 J. Jenkins, Canal Wharf, Merthyr Tydfil... £18,500
 D. Jones, Dowlais... 17,600
 Williams & Jones, Pontypridd... 17,250
 Thomas & Son, Cardiff... 16,080
 * Accepted.

PAIGNTON.—For waterworks (Contract No. 2): supply, delivery, and laying of about 19 miles of 15-in., 9-in., and 6-in. cast-iron water-mains, together with the requisite sluice valves, air valves, meters, wash-outs, and other fittings, the erection of a road bridge over the River Dart, and the construction of a covered service reservoir, boundary walls, and other works in connection with the Moorland water supply, for the Paignton Urban District Council. Mr. Frederick William Vanstone, engineer, Palace Chambers, Paignton:—

Gill & West, Southend-on-Sea... £58,245 5 0
 A. N. Coles, Stonehouse, Plymouth... 55,390 0 0
 S. Saunders, Earl's Court, London... 45,645 0 0
 W. C. Shaddock, Plymouth... 45,380 1 0
 C. T. Perkins, Bristol... 42,074 17 0
 A. Jenkins, Southwell, Notts... 42,354 15 8
 Westminster Construction Co... 41,193 0 0
 E. R. Lester, Portsmouth... 40,494 0 0
 Stephens & Sons, Exeter... 39,742 0 0
 J. & T. Bins, Croydon... 39,620 5 4
 W. Jones & Sons, Poole... 30,018 7 1
 J. Dickson, Dunsford, Exeter... 38,286 19 8
 J. H. Vickers, Nottingham... 37,428 7 9
 J. C. Lang, Liskeard... 37,404 11 1
 Pethick Bros., Plymouth... 37,363 0 0
 B. Cooke & Co., 16 Victoria Street, Westminster... 37,107 14 7
 Hawking & Best, Teignmouth... 34,971 11 0
 C. Brealy, Exeter... 34,905 0 0
 Dart & Pollard, Paignton... 33,960 14 9
 Gresenthwaite & Newton, Cardiff... 33,327 0 6
 * Accepted.

PLYMOUTH.—For enlargement of Head Post Office at Plymouth for the Commissioners of H.M. Works and Public Buildings:—

Pethick Bros... £15,444 £100
 S. Roberts... 14,490 72
 Wakeham & Co... 14,136 150
 J. P. Berry... 12,652 0 113
 J. H. Blackell & Son... 12,879 5 75
 Matcham & Co., Ltd... 12,375 123
 J. Partridge... 12,350 100
 J. J. Welland... 12,045 80
 W. E. Blake... 11,510 900
 Tozer & Son... 11,890 225
 A. Andrews... 11,777 107
 A. R. Lethbridge & Son... 11,732 150
 A. N. Coles... 11,492 70
 Laphorn & Co... 11,477 300
 J. Marshall... 11,472 175
 * Accepted. [A. Old materials.]

STAMFORD (Lincs.).—For new sewers, together with man-holes, lamp-holes, flushing tanks, ventilators, and other works connected therewith, for the Corporation. Mr. J. B. Everard, M.I.C.E., engineer, 6 Millstone Lane, Leicester:—

J. D. Nowell & Son, Westminster... £91,144 2 4
 J. Mackay, Snettisham... 59,911 8 0
 T. Philbrick, Leicester... 58,901 0 0
 J. Jackson, Plaistow... 53,955 6 5
 J. H. Vickers, Ltd., Nottingham... 51,111 4 6
 C. Chamberlain, Leicester... 49,556 3 3
 H. Ashley, Mansfield... 47,083 0 0
 G. Osenton, Westham... 47,398 5 11
 T. Bins, Croydon... 45,295 2 11
 H. Tyson, Halifax... 44,912 15 0
 G. Bell, Tottenham... 44,658 0 0
 F. Barlow, Rothwell... 44,457 7 0
 W. G. Whitnott, Rushmore... 44,390 0 0
 Johnson & Langley, Leicester... 41,609 0 0
 W. Jones & Son, Neath... 41,233 0 0
 Perkins, Craig, and Co., Manchester... 41,100 6 0
 W. Moss & Sons, Loughborough... 40,690 0 0
 J. Dickson, St. Albans... 40,655 0 0
 B. Cooke & Co., Westminster... 39,510 0 0
 A. Braithwaite & Co., Leeds... 39,068 0 0
 G. F. Tomlinson, Derby... 37,590 0 0
 Wilkinson Bros., Finsbury Park... 35,552 0 0
 F. F. Simpson, Leeds... 34,497 10 4
 F. S. Dawson, Blackpool... 34,431 11 8
 Bentley & Loch, Leicester... 34,131 14 0

SEDELEY.—Accepted for the erection of a cottage, Castle Street, Sedgley, for Mr. Charles Jones. Mr. F. B. Howarth, architect, Town Hall Chambers, Bilston, and Elymore Road, Sedgley:—
 B. Fullwood... £261

SEDELEY.—Accepted for the erection of two villas, Dudley Road, Sedgley, for Mr. S. Porter. Mr. F. B. Howarth, architect, Town Hall Chambers, Bilston, and Elymore Road, Sedgley:—
 B. Fullwood, Sedgley... £670

[Lowest of eight tenders; not including painting or paving.]

SNETTISHAM, NORFOLK.—For the erection of a house at Snettisham for Mr. E. Lambert. Mr. Herbert J. Green, architect, 31 Castle Meadow, Norwich:—
 Chivers & Son, Snettisham... £1,503 10 4
 F. Giddings, St. Ives, Hunts... 1,292 0 0
 Chambers & Son, Snettisham... 1,284 0 0
 Reuben Shanks, Chatteris, Cambs... 1,264 0 0
 F. Southgate, Hunstanton... 1,242 0 0
 * Accepted conditionally.

SOUTHEND-ON-SEA.—For the erection of a new cemetery chapel, Sutton Road, Southend-on-Sea, for the Southend Church League. Mr. S. I. Adams, architect, Weston Chambers, Weston Road, Southend-on-Sea:—

Sumpter Bros, Plaistow... £297
 Moss... 615
 P. & E. Davey... 610
 Whiur... 507
 Dupont... 350
 Harris & Rowe, Shoebury... 545
 W. E. Davey... 535
 (Rest of Southend.) * Accepted.

STAMFORD.—For the erection and completion of an engine-house, cottage, and outbuildings thereto, to be erected in Albert Road, in the borough of Stamford, for the Corporation. Mr. J. B. Everard, M.I.C.E., engineer, 6 Millstone Lane, Leicester:—

Bax & Dawson, Leicester... £2,067 13 7
 J. Jackson, Plaistow... 2,161 4 0
 W. & M. Halkes, Lincoln... 1,740 17 0
 W. Moss & Sons, Loughborough... 1,736 9 0
 E. D. Goodwin, Melton... 1,638 10 6
 C. Chamberlain, Leicester... 1,600 10 0
 E. Bowman & Son, Stamford... 1,587 0 0
 J. Riddett & Sons, Leicester... 1,587 0 0
 J. Woolston, Stamford... 1,497 0 0
 J. W. Rowe, Peterborough... 1,471 13 6
 Hinson & Co., Stamford... 1,451 19 6

TILBURY DOCKS (Essex).—For making up roads under the Private Improvement Act, for the Orsett Rural District Council. Mr. Frederick Lower, surveyor, Hornchurch:—

J. Burrell, Manor Park... £7,077 15 5
 J. Dickson, St. Albans... 5,890 0 0
 W. Gibbs & Co., Ilford... 5,006 7 0
 W. Coker, Rochester... 4,875 18 4
 Wilson, Border & Co., Ilford... 4,362 6 2
 J. Jackson, Forest Gate... 4,270 0 0
 J. W. Marsh, Orsett... 4,162 17 1
 W. Thair, Bexley... 4,512 2 0
 D. T. Jackson, Barking... 4,464 8 0
 W. Gibbs, Linch... 4,440 10 0
 G. Turp, Little Thurrock... 4,386 6 10
 Ambrose & Co., Grays... 4,147 0 0

WALLINGTON (Surrey).—For construction of about one mile of new roads, with sewers and storm-water drains complete, on the Woodcote Estate, Wallington, for the Imperial Property Investment Co., Ltd. Mr. W. J. Parker, surveyor, Great James Street:—

J. Dinmore, Crouch End... £7,450
 W. Neave & Son, Paddington... 6,064
 T. Cotterill, London, N... 6,785
 T. Adams, Wood Green, N... 5,772
 * Accepted.

WEST HAM.—For the erection of a block of school buildings and appendances, to be known as the Holborn Road Schools, Canning Town, for the West Ham School Board. Mr. W. Jacques, architect, 2, Fen Court, Fenchurch Street, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

B. E. Nightingale... £22,345 W. J. Maddison... £28,695
 A. E. Symes... 31,293 G. Sharpe... 18,744
 Badley, Sons & Holness... 39,416 Grezar & Sons... 28,100
 Simpson & Co... 29,286 A. Reed... 27,976
 W. Gladding... 29,289
 * Accepted subject to the approval of the Board of Education.

WEALDSTONE (Harrow).—For the erection of a shop at Wealdstone. Messrs. Clarke & Charles, architects, the Harrow Estate Offices, Peterborough Road, Harrow. No quantities supplied:—

C. Simmons, Harlesden... £250
 J. J. Bailey, Wealdstone... 650
 M. Dymock, Wealdstone... 650

New Companies.

County Land and House Co., Ltd.

Registered to acquire and deal with, in such manner as the company shall see fit, any land, house and other property, freehold and leasehold ground rents; as manufacturers of and dealers in bricks, tiles and other building materials. Capital £25,000 in £5 shares. The first directors are W. Bennett, J. Colborne, S. Denman, R. Piper, B. J. Saunders and L. Titcomb.

Hong Kong Tramway Electric Co., Ltd.

Registered as electricians and electrical engineers at Hong Kong and elsewhere in Asia. Capital £300 in £1 shares.

Limerick Foundry, Ltd.

Registered to carry on the general business of ironfounders, merchants, engineers, manufacturers of and dealers in every description of goods connected with iron, hardware or metals. Capital £100 in £1 shares. Registered office: Mill Street, Great Bridge, Tipton, Staffordshire.

The Loches Sawmills Co., Ltd.

Registered to acquire and carry on the business of Thomas Donald, sawmiller and timber merchant, Dundee. Capital £8,000 in £1 shares. Registered office: Donald Street, Dundee.

CURRENT MARKET PRICES.

FORAGE.

	£ s. d.	£ s. d.
Beans per qr.	1 10 0	
Clover, best per load	4 15 0	5 10 0
Hay, best do.	5 5 0	5 12 6
Straw do.	4 10 0	5 5 0
Sainfoin mixture do.	1 8 0	2 0 0

OILS AND PAINTS.

Castor Oil, French per cwt.	1 7 0	1 8 7
Colza Oil, English do.	1 8 0	
Coppers per ton	2 0 0	
Lard Oil per cwt.	2 9 6	
Lead, white, ground, carbonate do.	1 4 10	
Do. red do	1 0 4	
Linseed Oil, barrels do	1 11 0	
Petroleum, American per gal.	0 0 6½	0 0 7
Do. Russian do.	0 0 6½	0 0 6½
Pitch per barrel	0 7 0	
Shellac, orange per cwt.	6 1 0	
Soda, crystals per ton	3 2 6	3 5 0
Tallow, Home Melt per cwt.	1 9 6	1 11 0
Tar, Stockholm per barrel	1 3 6	
Turpentine per cwt.	1 10 7½	

METALS.

Copper, sheet, strong per ton	71 0 0	
Iron, Staffs., bar do.	6 5 0	8 10 0
Do. Galvanised Corrugated sheet do.	11 10 0	11 15 0
Lead, pig, Soft Foreign do.	11 12 6	11 15 0
Do. do. English common brands do.	12 0 0	12 2 6
Do. sheet, English 3lb per sq. ft. and upwards do.	13 0 0	
Do. pipe do.	13 10 0	
Nails, cut clasp, 3in to 6in. per ton	9 0 0	
Do. floor brads do.	8 15 0	
Steel, Staffs., Girders and Angles do.	5 15 0	6 5 0
Do. do. Mild bars do.	6 10 0	7 0 0
Tin, Foreign do.	114 10 0	115 0 0
Do. English ingots do.	118 0 0	118 10 0
Zinc, sheets, Silesian do.	21 0 0	
Do. do. Vieille Montaigne do.	21 10 0	
Do. Spelter do.	17 15 0	17 17 6

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel .. per load	2 1 0	
Pine, Quebec, Yellow .. per load	4 7 6	6 0 0
Do. Pitch do.	2 9 0	8 0 0
Laths, log, Dantzic .. per fath.	4 10 0	5 10 10
Do. Petersburg .. per bundle	0 8	
Deals, Archangel 2nd & 1st per P. Std.	13 5 0	22 0 0
Do. do. 4th & 3rd do.	10 15 0	12 10 0
Do. do. unsorted do.	5 12 6	6 10 0
Do. Riga do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow .. do.	9 0 0	15 0 0
Do. do. 2nd do.	8 0 0	11 10 0
Do. do. White do.	7 5 0	11 10 0
Do. Swedish do.	8 10 0	12 5 0
Do. White Sea do.	10 10 0	11 15 0
Do. Quebec Pine, 1st do.	19 10 0	21 5 0
Do. do. 2nd do.	9 0 0	18 10 0
Do. do. 3rd & 4th do.	7 0 0	10 10 0
Do. Canadian Spruce, 1st .. do.	7 10 0	9 5 0
Do. do. 3rd & 2nd do.	7 5 0	9 0 0
Do. New Brunswick do.	7 5 0	8 0 0

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
March 6	Crosthwaite—Vicarage	—	J. Bintley, 7 Lowther Street, Kendal.
" 6	Berford—Church Restoration	—	Nicholson & Hartree, Architects, Hereford.
" 6	Huddersfield—Two Semi-detached Villas	—	J. Kirk & Sons, Architects, Huddersfield.
" 6	Ipswich—Ejector Chamber	Corporation	E. Buckham, Borough Surveyor, Town Hall, Ipswich.
" 6	Woolwich—Steam Roller Shed, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 6	Salford—Retort House Floor, Fittings, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
" 6	Barnsley—Masonry Piers for Pipe Bridges	Corporation	Borough Surveyor, Barnsley.
" 6	London S.E.—Committee-rooms, Lavatories, &c.	Bermundsey Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Spa Road, S.E.
" 6	Rotherham—Three Dwelling Houses	H. Parkin	J. Platts, Architect, Old Bank Buildings, High Street, Rotherham.
" 6	Bristol—Materials for 31 Houses	—	Bramble, Watts, Page & Thompson, 2 Bristol Chambers, Nicholas Street, Bristol.
" 7	Leadgate, Durham—Stable, Coach-House, &c.	Dr. Henley	Dr. Henley, Front Street, Leadgate.
" 7	Lossiemouth, Scotland—Infant School, &c.	—	A. & W. Reid & Wittet, Architects, Elgin.
" 7	Cardiff—Building Materials	Union Guardians	A. J. Harris, Clerk, Queen's Chambers, Cardiff.
" 7	Derby—Bricks, Cement, Lime	Town Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
" 7	Birr, King's Co.—Post Office & Caretaker's Residence	—	H. Williams, Secretary, Office of Public Works, Dublin.
" 8	Hazelwell, near Birmingham—Station	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
" 8	Sheffield—Foundry, &c.	University College	Gibbs & Flockton, 15 St. James's Row, Sheffield.
" 8	Stockton-on-Tees—Banking Premises	North-Eastern Banking Co., Ltd.	W. H. Linton, 13 Exchange, Stockton-on-Tees.
" 8	Longtown, Carlisle—Two Stone Bridges	Rural District Council	J. Murray, County Surveyor, The Courts, Carlisle.
" 8	Harrow—Alterations, &c., to Cottage	Urban District Council	J. P. Bennetts, Engineer, Council Offices, Harrow-on-the-Hill.
" 8	Blackburn—Rubble Walling	Gas Committee	W. Stubbs, Municipal Offices, Blackburn.
" 8	Hexham—Underground Convenience	Urban District Council	R. T. Surtees, Surveyor, Hexham.
" 8	Penycuik, Wales—Two Cottages	Miss S. Morris	J. Hurley & Son, 10 Bridgend Road, Tondur, Aberkenfig.
" 8	Rotherham—Workmen's Cottages	Midland Railway Co.	Gibbs & Flockton, 15 St. James's Road, Sheffield.
" 8	Smethwick—Bricks, Cement, Lime, &c.	Corporation	O. J. F. Allin, Borough Surveyor, Town Hall, Smethwick.
" 8	Swindon—Bricks, Cement, Lime, &c.	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
" 8	Vergemount, Clonskeagh—Isolation Hospital	Rathmines and Pembroke Hospital Board	F. P. Fawcett, Clerk, Town Hall, Rathmines, co. Dublin.
" 8	Bessbrook, co. Armagh—Convent	Canon Quin	A. Ferguson, Surveyor, Scottish Provident Buildings, Wellington Place, Belfast.
" 10	Brampton, Cumberland—Police Station	—	G. D. Oliver, 5 Lowther Street, Carlisle.
" 10	Dinas Cross, Wales—Roofing, &c., Chapel	—	Captain Pergrine, Smithfield Place, Dinas Cross.
" 10	Heston, Middlesex—Sexton's Cottage, &c.	New Brentford Burial Board	N. Parr & A. E. Kates, 5 Brent Road, Brentford, W.
" 10	Shaw, Lancs—School Chapel	—	H. Harper, 54 Long Row, Nottingham.
" 10	Ilford—Bricks, Cement, Lime, &c.	Urban District Council	H. Shaw, Surveyor, Public Offices, Ilford.
" 10	Warrington—Bricks, Tiles, Cement, &c.	Paving and Sewerage Committee	T. Longdin, Borough Surveyor, Town Hall, Warrington.
" 10	Leeds—Police Station Buildings	Watch Committee	H. A. Chapman, Architect, Westminster Chhrs, East Parade, Leeds.
" 10	Harnham—Rebuilding Inn, &c.	Gibbs, Mew & Co.	J. Harding & Son, Architects, Salisbury.
" 10	Stepney—Bricks, Lime, Fire Clay, Portland Cement	Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 10	Horsham—Additions, &c., to Hotel	—	W. Back, Architect, Horsham.
" 11	Barrow-in-Furness—Fire-clay Retorts, Firebricks, Lime, &c.	Corporation	Manager, Gas and Water Works, Barrow-in-Furness.
" 11	King's Heath, nr. Birmingham—Bricks, Cement, Lime	Urban District Council	Surveyor, 23 Valentine Road, King's Heath.
" 11	West Ham—Electric Generating Station	Corporation	Borough Engineer, Town Hall, West Ham.
" 12	Hull—Sorting Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.
" 12	Dewsbury—Sixteen Houses	—	W. & D. Thornton, Architects, Oates Street, Dewsbury.
" 12	Langho, nr. Blackburn—Home for Inebriates	Lancs. Inebriates Acts Board	H. Little, County Architect, County Offices, Preston.
" 12	Warrington—House and Alterations to Baths	Corporation	Borough Engineer, Town Hall, Warrington.
" 12	Manchester—Electricity Sub-Station	Corporation	City Surveyor, Town Hall, Manchester.
" 12	Kendal—Alterations to Hotel	—	J. Stalker, 57 Highgate, Kendal.
" 12	Hull—Parkkeeper's Lodge	Corporation	J. H. Hirst, City Architect, Town Hall, Hull.
" 13	London—Gate Port's Lodge and Addition to House	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 13	Stratford-on-Avon—Infirmary for Women	Union Guardians	C. Smith & Son, 164 Friar Street, Reading.
" 13	Blackpool—Lime, Cement, Bricks, &c.	Highways Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 14	Pilton—Two Cottages	—	J. Thomas, Bailiff, Bullhill, Pilton.
" 14	Preston—Alterations, &c., to Public House	—	Borough Surveyor, Town Hall, Preston.
" 14	London, N.W.—Foundations to Power Station	St. Pancras Borough Council	Electricity Department Offices, 57 Pratt Street, N.W.
" 14	Hereford—Municipal Buildings	Town Council	H. A. Cheers, Architect, Twickenham, W.
" 15	Aberavon—Retort House, Coal Store, &c.	Corporation	T. Newbigging & Son, 5 Norfolk Street, Manchester.
" 15	Haslingden—Bricks, Ashlar Stone, Landings, Cement	Town Council	J. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 15	Newcastle-upon-Tyne—Alterations, &c., to Premises	School Board	O. S. Errington, Architect, Victoria Buildings, Grainger Street West Newcastle.
" 15	Radcliffe, Lancs—Engine House, Boiler, House, &c.	Urban District Council	W. L. Rothwell, Engineer, Council Office, Radcliffe.
" 15	Belmullet, co. Mayo—Rectory	—	J. S. Cairns, Architect, Dillon Terrace, Ballina.
" 15	Balham, S.W.—Alterations, &c., to Branch Library	Wandsworth Borough Council	Surveyor, 215 Balham High Road, S.W.
" 17	London, S.E.—Bricks, Lime, &c.	Bermundsey Borough Council	F. Ryall, Town Clerk, Town Hall, Bermundsey.
" 17	Knotty Ash, near Liverpool—Infirmary	Parish Vestry	E. Kirby & W. E. Willink, 5 Cook Street, Liverpool.
" 17	Newmarket—Workhouse Extensions	Guardians	Holland & Sons, Architects, High Street, Newmarket.
" 17	Aughton, near Sheffield—Hospital	—	J. D. Webster, 19 St. James Street, Sheffield.
" 17	Halifax—Model Bakery, Two Shops, Offices, &c.	G. Whitley & Son	J. F. Walsh & G. Nicholas, Architects, Museum Chambers, Halifax.
" 18	Huddersfield—Repairs to Lodge	Burial Joint Committee	F. R. Longmore, Clerk, High Street, Huddersfield.
" 21	Sheffield—Salesshops and Premises	A. Davy & Sons, Ltd.	Gibbs & Flockton, 15 St. James's Road, Sheffield.
No date.	Loughborough—Rebuilding, and Bank Premises	H. F. Young	A. E. King, Architect, Baxter Gate, Loughborough.
"	Weybridge, Surrey—Additions to Schools and House	—	A. H. Ryan-Tenison, 12 Little College Street, Westminster, S.W.
ENGINEERING:			
Mar. 6	Chapelton, near Sheffield—Waterworks	Wortley Rural District Council	D. Bell, Mangr., Waterworks, Potter Hall, High Green, Chapelton.
" 6	Uxbridge—Drainage Works at Workhouse	Union Guardians	Engineer, Corn Exchange, Uxbridge.
" 6	Southend-on-Sea—Electric Batteries	Corporation	W. E. J. Heenan, Borough Engineer, Southend-on-Sea.
" 6	Aberdeen—Electric Tramcars	Tramway Department	J. A. Bell, Electricity Works, Cotton Street, Aberdeen.
" 6	Aberdeen—Electrical Equipment of Tramways	Tramway Department	J. A. Bell, Electricity Works, Cotton Street, Aberdeen.
" 6	Annan, Dumfries—Waterworks	—	J. Barbour, 53 Buccleuch Street, Dumfries.
" 6	Thurso, near Doncaster—Sewage Outfall Works	Rural District Council	J. Simmons, Bank Chambers, Doncaster.
" 7	Oban, Scotland—Electric Lighting Plant	Corporation	Burshall & Monkhouse, 14 Old Quea Street, Westminster, S.W.
" 7	Pontypriid—Electrical Equipment of Tramways	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
" 8	Bournemouth—Switchboards	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
" 8	Bristol—Steam Fire Float	Corporation	W. W. Squire, Engineer, Cumberland Basin, Bristol.
" 8	Swansea—Electrical Plant	Corporation	C. A. L. Prusmann, Borough Elec. Engineer, Elec. Wrks., Swansea.
" 10	Dewsbury—Cooling Tower Pump, &c.	Electricity Committee	Borough Elec. Engineer, Electricity Wks., Bradford Rd., Dewsbury.
" 10	King's Lynn—Waterworks Extension	Corporation	H. J. Weaver, Borough Engineer, Town Hall, King's Lynn.
" 10	Langport, Somerset—Waterworks	Rural District Council	E. Q. Louch, Clerk, Council Offices, Langport.
" 10	Manchester—Electrical Equipment of Tramways	Tramways Committee	J. M. McElroy, 55 Piccadilly, Manchester.
" 10	Bo'ness, Scotland—Cutting Reservoir Bank	Town Council	J. P. Lawrie, Burgh Surveyor, Bo'ness.
" 10	Loughborough, Leics—Water Main	Guardians	Master, Workhouse, Loughborough.
" 10	Callender—Widening Railway	Callender and Oban Railway Co.	Company's Engineer, Buchanan Street Station, Glasgow.
" 10	Manchester—Subway for Electric Cables	Corporation	City Surveyor, Town Hall, Manchester.
" 11	London, S.E.—Boiler, &c., at Baths	Camberwell Borough Council	W. Oxboby, Borough Engineer, Town Hall, Camberwell.
" 11	London, S.W.—Overhead Traveller	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 11	Elland, Yorks—Electrical Plant	Urban District Council	W. Emmott, 35 Commercial Street, Halifax.
" 11	Oswestry—Railway Wagons	Cambrian Railways Co.	Locomotive and Carriage and Wagon Superintendent, Oswestry.
" 11	London, E.C.—Electric Cables and Sundries, Eng'neers' Stores, &c.	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Shoreditch Town Hall, Old Street, E.C.
" 11	London, S.W.—Stoneware Ducts for Electric Cables	London County Council	County Hall, Spring Gardens, S.W.
" 11	Hertford—Water Mains, &c.	Corporation	J. H. Jevons, Borough Surveyor, Hertford.
" 12	Hartlepool—Conduit	Gas and Water Co.	Secretary, Company's Offices, West Hartlepool.
" 12	Burgess Hill, Sussex—Electricity Supply Works	Urban District Council	Clerk, Council Offices, Burgess Hill, Sussex.
" 12	St. Helens, Lancs—Reservoir	Water Committee	J. J. Lackland, Water Engineer, Town Hall, St. Helens.
" 14	Danbury, Essex—Water Supply Works	Chelmsford Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
" 15	Arnsby—Re-erecting Bridge	South Westmorland R.D.C.	A. Milne, Clerk, Council Office, Kendal.
" 17	Prestonpans, Scotland—Waterworks	Haddington County Council	J. D. Watson, County Clerk, Haddington.
" 18	Tynemouth—Gravitation Main	Corporation	J. Mansergh, 5 Victoria Street, Westminster.
" 18	Birkenhead—2 Ferry Steamers	Corporation	Ferries Manager, Woodside, Birkenhead.
" 19	Walsend—Refuse Destructor, &c.	Council	G. Hollings, Borough Surveyor, Walsend.
No date.	Kentmere—Bridge	South Westmoreland R.D.C.	J. Bintley, 7 Lowther Street, Kendal.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL:			
M. r. 8	Swindon—Iron Castings, Pipes, &c.	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
" 8	Smethwick—Tools, Ashbins, Gully Grates, Manhole Covers, &c.	Corporation	O. J. F. Allin, Borough Surveyor, Town Hall, Smethwick.
" 10	Warrington—Cast-iron Gullies, &c.	Paving and Sewerage Committee ..	T. Longdin, Borough Surveyor, Town Hall, Warrington.
" 10	Salford—Bolts, Iron and Steel, &c.	Tramways Committee	General Manager, Tramways Department, Town Hall, Salford.
" 10	Preston—Cast-iron Pipes, Manhole Covers, &c.	Corporation	Borough Surveyor, Town Hall, Preston.
" 10	Heston, Middlesex—Iron Gates, Railings, &c.	New Brentford Burial Board	N. Park & A. E. Kates, 5 Brent Road, Brentford, W.
" 10	Whyteleafe, Surrey—Cast-iron Pipes	Caterham Gas Co., Ltd.	D. H. Anderson, Engineer, Gasworks, Whyteleafe.
" 10	Batley, Yorks—Ironmongery	Town Council	O. J. Kirby, Borough Surveyor, Market Place, Batley.
" 10	London, S.W.—Ironmongery, &c.	Barnes Urban District Council ..	G. B. Tones, Surveyor, Council Offices, High Street, Mortlake, S.W.
" 10	Downpatrick—Iron Isolation Hospital	Stepney Borough Council	J. Heron, County Surveyor, The Courthouse, Downpatrick.
" 10	London, E.—Cast-iron Gully Frames, &c.	Corporation	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 11	Barrow-in-Furness—Cast-iron Pipes, Wrought-iron tubes, &c.	Corporation	Manager, Gas and Waterworks, Barrow-in-Furness.
" 11	Coventry—Castings, Tools, &c.	General Works Committee	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 11	King's Heath, near Birmingham—Stores	Urban District Council	Surveyor, 23 Valentine Road, King's Heath.
" 11	London, E.C.—Stores, &c.	Shoreditch Borough Council ..	H. M. Robinson, Town Clerk, Shoreditch Town Hall, Old St., E.C.
" 11	Cublington, Warwickshire—Lamp Columns	Parish Council	T. Whitmore, Clerk, Council Offices, Cublington.
" 12	Eccles, Lancs—Materials	Corporation	T. S. Pictou, Borough Surveyor, Town Hall, Eccles.
" 12	Rishton—Castings, Gulleys, &c.	Urban District Council	J. J. Adams, 4 Church Street, Rishton.
" 12	London, N.—Stores, &c.	Hornsey Urban District Council ..	E. J. Lovegrove, Engineer, Southwood Lane, Highgate, N.
" 12	Grpsport—Railway	Urban District Council	H. Frost, Surveyor, Town Hall, Gosport.
" 12	Reading—Street Lamp Columns, Manhole Covers, &c.	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
" 13	Blackpool—Stores	Highway Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 15	Haslingden—Castings, Tools, &c.	Town Council	J. S. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 17	London, S.E.—Ironmongery, &c.	Bermondsey Borough Council ..	F. Ryall, Town Clerk, Town Hall, Bermondsey.
" 19	St. Helens, Lancs—Manhole Covers, &c.	Corporation	G. J. C. Broom, Borough Engineer, Town Hall, St. Helens.
" 22	Sutton Coldfield—Bar-iron, Iron Castings, &c.	Corporation	W. A. H. Clarry, Borough Engineer, Town Hall, Sutton Coldfield.
April 23	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
" 23	Calcutta—Stopcocks.	Corporation	F. Gainsford, Secretary, Corporation Offices, Calcutta.
PAINTING AND PLUMBING:			
M. r. 7	Birmingham—Painting & Cleaning Goods Depot, &c.	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
" 8	Derby—Brushes, Paints, Oils, &c.	Town Council	Borough Surveyor, Babington Lane, Derby.
" 10	Swindon—Paints, &c.	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
" 10	London, E.—Colours, Varnishes, Oils, Brushes, &c.	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 10	Preston—Oil, White Lead, Paint, &c.	Corporation	Borough Surveyor, Town Hall, Preston.
" 10	Lerds—Painting, &c.	Corporation	City Engineer, Leeds.
" 10	Salford—Lead, Paints, Oils, &c.	Tramways Committee	General Manager, Tramways Department, Town Hall, Salford.
" 12	London, E.C.—Plumber's Work, &c.	Shoreditch Borough Council ..	H. M. Robinson, Town Clerk, Shoreditch Town Hall, Old St., E.C.
" 13	Reading—Paint, Oils, &c.	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
" 13	Blackpool—Brushes, Oils, Paints, &c.	Highway Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 17	London, S.W.—Painting, &c.	Metropolitan Asylums Board ..	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 17	London, S.E.—Paints, Oils, &c.	Bermondsey Borough Council ..	F. Ryall, Town Clerk, Town Hall, Bermondsey.
ROADS AND CARTAGE:			
Mar. 6	Colchester—Goods and Materials	Roads and Drainage Committee ..	H. Goodyear, Borough Surveyor, Colchester.
" 6	Croydon—Horses, Carts, &c.	Council	Borough Road Surveyor, Town Hall, Croydon.
" 6	Woolwich—Water Vans, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 6	Croydon—Materials	Town Council	Borough Road Surveyor, Town Hall, Croydon.
" 6	Lutterworth—Granite, &c.	Monks Kirby Rural District Council	J. C. Coates, District Surveyor, Lutterworth.
" 6	Stockport—Street Works	Highways and Sewers Committee ..	J. Atkinson, Borough Surveyor, St. Peter's Gate, Stockport.
" 6	New Brompton, Kent—Carriage, Materials, &c.	Gillingham Urban District Council	Surveyor, Council Offices, New Brompton, Kent.
" 6	Hampstead—General Team Work	Borough Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.
" 7	Walton-on-Thames—Materials	Urban District Council	C. J. Jenkins, Surveyor, Walton-on-Thames.
" 7	Derby—Stones and Materials	Town Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
" 7	Cheadle, near Manchester—Materials	Urban District Council	E. Sykes, 9 High Street, Cheadle.
" 8	Hull—Stone for Macadamising	Corporation	A. E. White, City Engineer, Town Hall, Hull.
" 8	Swindon—Materials	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
" 8	Smethwick—Materials	Corporation	O. J. F. Allin, Borough Surveyor, Town Hall, Smethwick.
" 8	Bexley Heath, Kent—Water Van	General Purposes Committee ..	W. T. Howse, Surveyor, Public Hall, Bexley Heath.
" 8	Leeds—Horse Hire, Materials, &c.	Sanitary Committee	G. Darley, Superintendent, Dock Street, Depot, Leeds.
" 8	Abersychan, Wales—Road Improvements	Urban District Council	E. Cook, Surveyor, Abersychan.
" 8	Bexley Heath, Kent—Materials	Urban District Council	W. T. Howse, Surveyor, Public Hall, Bexley Heath.
" 8	Billesdon, Leics—Materials	Rural District Council	W. E. Richardson, 18 New Street, Leicester.
" 8	Harrow—Kerb, &c., Paving (Two Contracts)	Urban District Council	J. P. Bennetts, Engineer, Council Offices, Harrow-on-the-Hill.
" 8	Ponteland—Materials, &c.	Castle Ward Rural District Council	D. Hope, Surveyor, Ponteland.
" 8	Rotherham—Materials, &c.	Rural District Council	R. Bradbury, 29B High Street, Rotherham.
" 8	Smethwick—Road Works	Corporation	O. J. F. Allin, Borough Surveyor, Town Hall, Smethwick.
" 10	Poplar—Tar Paving Materials and Wood Paving	London County Council	Parks Department, 11 Regent Street, S.W.
" 10	Abergavenny—Materials	Rural District Council	J. Gill, 4 Brecon Road, Abergavenny.
" 10	Broadstairs—Making-up, &c.	Urban District Council	H. Hurd, Town Surveyor, Council Offices, Broadstairs.
" 10	Griffithstown, Wales—Road Works	Panteg Urban District Council ..	J. Wallace, Surveyor, Sunny Bank, Griffithstown.
" 10	Heston, Middlesex—Paths, Graveling, &c.	New Brentford Burial Board ..	N. Park & A. E. Kates, 5 Brent Road, Brentford, W.
" 10	Jarrow—Road Works	Stepney Borough Council	Borough Surveyor, Town Hall, Jarrow.
" 10	London, E.—Paving Works	Urban District Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 10	Romford—Materials	Rural District Council	J. Turvey, Surveyor, Council Offices, Romford.
" 10	Wimborne, Dorset—Road Works	Urban District Council	R. T. S. Seymour, District Surveyor, Wimborne Minster.
" 10	Ilford—Materials	Tramways Committee	H. Shaw, Surveyor, Public Offices, Ilford.
" 10	Salford—Materials	Paving and Sewerage Committee ..	General Manager, Tramways Department, Town Hall, Salford.
" 10	Warrington—Materials and Stores	Stepney Borough Council	T. Longdin, Borough Surveyor, Town Hall, Warrington.
" 10	London, E.—Asphalt Paving	Barnes Urban District Council ..	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 10	London, S.W.—Materials, Carriage, &c.	Town Council	G. B. Tones, Surveyor, Council Offices, High Street, Mortlake, S.W.
" 10	Batley, Yorks—Materials, &c.	Urban Sanitary Authority	O. J. Kirby, Borough Surveyor, Market Place, Batley.
" 11	Path—Materials, &c.	Urban District Council	City Surveyor, Bath.
" 11	Barking, Essex—Materials	Shoreditch Borough Council ..	F. H. Lister, Clerk, Public Offices, Barking.
" 11	London, E.C.—Stores and Materials	Urban District Council	H. M. Robinson, Town Clerk, Shoreditch Town Hall, Old St., E.C.
" 11	King's Heath, near Birmingham	General Works Committee	Surveyor, 23 Valentine Road, King's Heath.
" 11	Coventry—Materials	Corporation	J. E. Swindlehurst, City Surveyor, St. Mary's Hall, Coventry.
" 12	Glasgow—Whinstone Metal	Corporation	H. Hutcheson, 115 Wellington Street, Glasgow.
" 12	Feels, Lancs—Materials	Urban District Council	T. S. Pictou, Borough Surveyor, Town Hall, Eccles.
" 12	Rishton—Materials and Stores	Rural District Council	J. J. Adams, 4 Church Street, Rishton.
" 12	Bridport—Road Repairs	Corporation	J. W. S. Bartlett, 72 West Bay Road, Bridport.
" 12	South Shields—In Situ Concrete Footpaths	Hornsey Urban District Council ..	S. E. Burgess, Borough Engineer, Chapter Row, South Shields.
" 12	London, N.—Materials	Corporation	E. J. Lovegrove, Engineer, Southwood Lane, Highgate, N.
" 12	Reading—Materials	Rural District Council	J. Bowen, Borough Engineer, Town Hall, Reading.
" 12	Bingham, Notts—Materials	Rural District Council	R. H. Beaumont, Clerk, Market Street, Bingham.
" 12	Readington, Oxford—Materials	Town Council	L. Turner, Surveyor, Hartfield Cottage, New Headington.
" 12	Tenterden, Kent—Quartzite	Highway Committee	W. L. O. Turner, Borough Surveyor, Town Hall, Tenterden.
" 13	Blackpool—Stores and Materials	Rural District Council	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 13	Clare, Suffolk—Granite	Rural District Council	W. H. Carr, Surveyor, Clare.
" 15	Burnley—Materials and Stores	Town Council	S. Edmondson, 18 Nicholas Street, Burnley.
" 15	Haslingden—Materials and Stores	Bermondsey Borough Council ..	J. S. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 17	London, S.E.—Materials	Urban District Council	F. Ryall, Town Clerk, Town Hall, Bermondsey.
" 17	Henwell, W.—Road Works	Corporation	S. W. Barnes, Surveyor, Council Offices, Church Rd. W., Hanwell, W.
" 18	Hertford—Road Works	Corporation	J. H. Jevons, Borough Surveyor, Hertford.
" 19	St. Helen's, Lancs—Materials and Stores	Urban District Council	G. J. C. Broom, Borough Engineer, Town Hall, St. Helen's.
" 21	Hoylelake, Cheshire—Materials and Stores	Corporation	L. G. Dasher, Surveyor, Council Offices, Hoylelake.
" 22	Sutton Coldfield—Materials	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
" 24	Maidstone—Road Repair and Maintenance	Kent County Council	F. W. Ruck, 86 Week Street, Maidstone.
" 29	Great Harwood, Lancs—Materials and Team Labour	Urban District Council	A. H. Dunkin, Surveyor, Town Hall, Great Harwood.
April 1	Dartford—Street Works	Urban District Council	W. Haston, 8 Hythe Street, Dartford.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
SANITARY :			
Mar. 6	Colchester—Pipes, Lime, &c.	Roads and Drainage Committee	H. Goodyear, Borough Surveyor, Colchester.
" 6	New Brompton, Kent—Drain Pipes	Gillingham Urban District Council	F. C. Boucher, Clerk, Council Offices, Gardiner St., New Brompton.
" 6	Uxbridge—Drainage Works at Workhouse	Union Guardians	Engineer, Corn Exchange, Uxbridge.
" 7	Walton-upon-Thames—Stoneware Goods	Urban District Council	O. J. Jenkin, Surveyor, Walton-on-Thames.
" 7	Durham—Scavenging	Rural District Council	J. Menzies, Inspector of Nuisances, Woodview, Shincliffe, Durham.
" 7	Derby—Disinfectants, Earthenware, &c.	Town Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
" 7	Brotherton, Yorks—Sewage Works	Pontefract Rural District Council	J. Waugh, Engineer, Sunbridge Chambers, Bradford.
" 8	Alford, Lincs—Sewers, &c.	Urban District Council	F. Massie, Engineer, Tetley House, Wakefield.
" 8	Bexley Heath, Kent—Stoneware Pipes, Disinfectants	Urban District Council	W. T. Howse, Surveyor, Public Hall, Bexley Heath.
" 8	Smethwick—Scavenging Brushes, Pipes, &c.	Corporation	C. J. F. Allin, Borough Surveyor, Town Hall, Smethwick.
" 8	Swindon—Pipes, Disinfectants, &c.	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
" 10	Warrington—Sewer Pipes, Disinfectants, &c.	Paving and Sewerage Committee	T. Longdin, Borough Surveyor, Town Hall, Warrington.
" 10	Ilford—Drain Pipes, Gulleys, Disinfectants, &c.	Urban District Council	H. Shaw, Surveyor, Public Offices, Ilford.
" 10	Whitefield, Lancs—Sewering Street	Urban District Council	T. Thorp & Son, Engineers, Knowsley Road, Whitefield.
" 10	Batley, Yorks—Sanitary Tubes, &c.	Town Council	O. J. Kirby, Borough Surveyor, Market Place, Batley.
" 10	London, E.—Drainage Materials	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 10	London, S.W.—Removal of Refuse, &c.	Barnes Urban District Council	G. B. Tomes, Surveyor, Council Offices, High Street, Mor lake, S.W.
" 11	Barking, Essex—Drain Pipes, Gulleys, Alumina-ferrie	Urban District Council	F. H. Lister, Clerk, Public Offices, Barking.
" 11	Rotherham—Removal of Night Soil	Rural District Council	B. Hey, 29B High Street, Rotherham.
" 11	West Bromwich—Sewage Outfall Works	Town Council	A. D. Greatorex, Borough Surveyor, Town Hall, West Bromwich.
" 11	Coventry—Stoneware Pipes, Disinfectants	General Works Committee	J. E. Swindhurst, City Surveyor, St. Mary's Hall, Coventry.
" 11	King's Heath, near Birmingham—Stoneware Pipes, Disinfectants	Urban District Council	Surveyor, 23 Valentine Road, King's Heath.
" 11	London, E.C.—Drain Pipes, &c.	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Shoreditch Town Hall, Old St., E.C.
" 12	Rishton—Sanitary Pipes, Gulleys, Scavenging, &c.	Urban District Council	J. J. Adams, 4 Church Street, Rishton.
" 12	London, N.—Disinfectants, &c.	Hornsey Urban District Council	E. J. Lovegrove, Council's Engineer, Southwood Lane, Highgate, N.
TIMBER :			
Mar. 6	Aberdeen—Firewood	Parish Council	O. B. Williams, 20 Union Terrace, Aberdeen.
" 6	London, S.W.—Oak Fencing	Wandsworth & Olapham Union Guardians	F. W. Piper, Clerk, Union Offices, St. John's Hill, S.W.
" 8	Swindon—Timber, Elm, Ash, Oak, &c.	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
" 10	London, W.—Timber	Great Western Railway Co.	G. K. Mill, Secretary, Fiddington Station, London.
" 10	Salford—Timber	Tramways Committee	General Manager, Tramways Department, Town Hall, Salford.
" 10	London, E.—Timber	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 10	London—Oak Fencing, Wood Blocks	London County Council	Parks Department, 11 Regent Street, S.W.
" 11	King's Heath, near Birmingham—Fir & other Timber	Urban District Council	Surveyor, 23 Valentine Road, King's Heath.
" 11	London, E.C.—Timber	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Shoreditch Town Hall, Old St., E.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Mar. 12	Antrim—Labourers' Cottages	£10.	J. Clark, Clerk, Rural District Council, Antrim.
" 14	Dunstable—Infectious Diseases Hospital	£5 5s.	O. C. S. Benning, Town Clerk, Dunstable.
" 15	London, S.W.—Military Ambulance Wagons	£500, £250.	Director-General of Ordnance (O. 7), War Office, Pall Mall, S.W.
" 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Edge, Sheffield.
" 29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
" 31	Wakefield—Improvement of Interior of Exchange Buildings	£25, £10.	J. J. Martin, Bull Hotel, Wakefield.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
" 8	Oldham—Market Hall and Shops	£50, £30, £20.	S. A. Pickering, Borough Surveyor, Oldham.
" 24	Coleraine—Twenty-five Workmen's Dwellings	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

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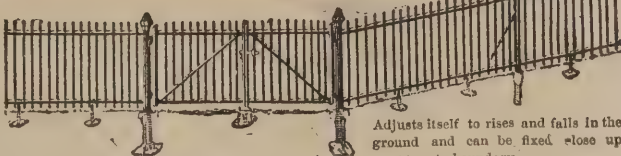
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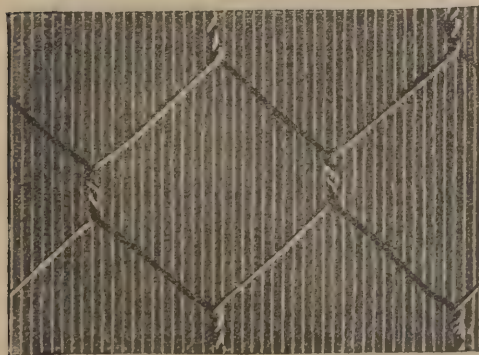
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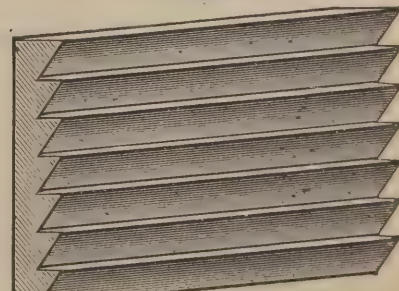
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COMING EVENTS.

Wednesday, March 5.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Meeting).—Mr. George Witlet on "A Visit to Oxford," 8 p.m.

ROYAL ARCHEOLOGICAL INSTITUTE.—Prof. T. McKenny Hughes on "Early Potters' Art in Britain," Mr. F. G. Hilton Price on "Pawnbrokers' Signs in London," 4 p.m.

THE CHEMICAL SOCIETY.—Meeting at 5.30 p.m.

BUILDERS' FOREMEN'S AND CLERKS OF WORKS' INSTITUTION.—Ordinary Meeting at 8 p.m.

BRITISH ARCHEOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and demonstration at L.C.C. Common Lodging-House, Parker Street, Drury Lane, W.C., at 3 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Works of the Vauxhall Bridge, at 2.30 p.m.

Thursday, March 6.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting, at 8.30 p.m.

CARPENTERS' COMPANY (Lectures at Carpenters' Hall).—Prof. W. Ramsay, LL.D., Ph.D., F.R.S., on "The Bearing of Modern Chemical Theory on some problems connected with the Building Trade," 8 p.m.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. N. O. Gedge, B.Sc., A.M.I.C.E., on "The Causes and the prevention of the Erosion of Sea Coasts," 8 p.m.

Friday, March 7.

ARCHITECTURAL ASSOCIATION.—Mr. James Miller on "The Glasgow Exhibition," 7.30 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. F. E. P. Edwards, A.R.I.B.A., on "Elme's Work in Liverpool."

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. Wilson Beaton on "Glasgow International Exhibition, 1901," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. Henry R. Kenwood on "Elementary Statistics," 7 p.m.

Saturday, March 8.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Edinburgh and Leith Corporation's New Gas Works at Granton.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Mr. Frank B. Lea, B.A., on "The Design of Conductors for Electric Railways."

ROYAL INSTITUTION.—Lord Rayleigh on "Some Electrical Developments"—IV., 3 p.m.

Monday, March 10.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. R. Elsey Smith, A.R.I.B.A., on "Building Materials," 7 p.m.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

Bristol Society of Architects.—Mr. Howard Chatfield Clarke, F.S.I., on "Ancient Lights," 8 p.m.

Tuesday, March 11.

ROYAL INSTITUTION.—Prof. E. B. Poulton on "Recent Researches on Protective Resemblance, Warning Colours and Mimicry in Insects"—I., 3 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Wright Clarke on "Details of Plumbers' Work," 7 p.m.

MANCHESTER SOCIETY OF ARCHITECTS (Students' Meeting).—Debate on "Is it possible to get Coloured Facades in this City?"

Wednesday, March 12.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Prof. G. Baldwin Brown on "Some Thoughts on the Dome as an Architectural Form," 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Annual Meeting at 7.30 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Annual Dinner at the Merchant Taylors' Hall, Threadneedle Street, E.C., at 7 p.m.

Thursday, March 13.

CARPENTERS' COMPANY, Carpenters' Hall, E.C.—Prof. T. Roger Smith, F.R.I.B.A., on "Exeter Cathedral," 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Ernest Newton on "House Building," 6.30 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Edwin O. Sachs on "Artistic Electric Illumination."

MANCHESTER SOCIETY OF ARCHITECTS.—Paper by Mr. Charles M. Hadfield.

Friday, March 14.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. H. C. Landers on "Co-operative Homes," 7.30 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Mr. Percival Marshall on "The Uses of Engineering Models," 8 p.m.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Mr. C. Hadfield, F.R.I.B.A., on "True Building."

PHYSICAL SOCIETY.—Meeting at 5 p.m.

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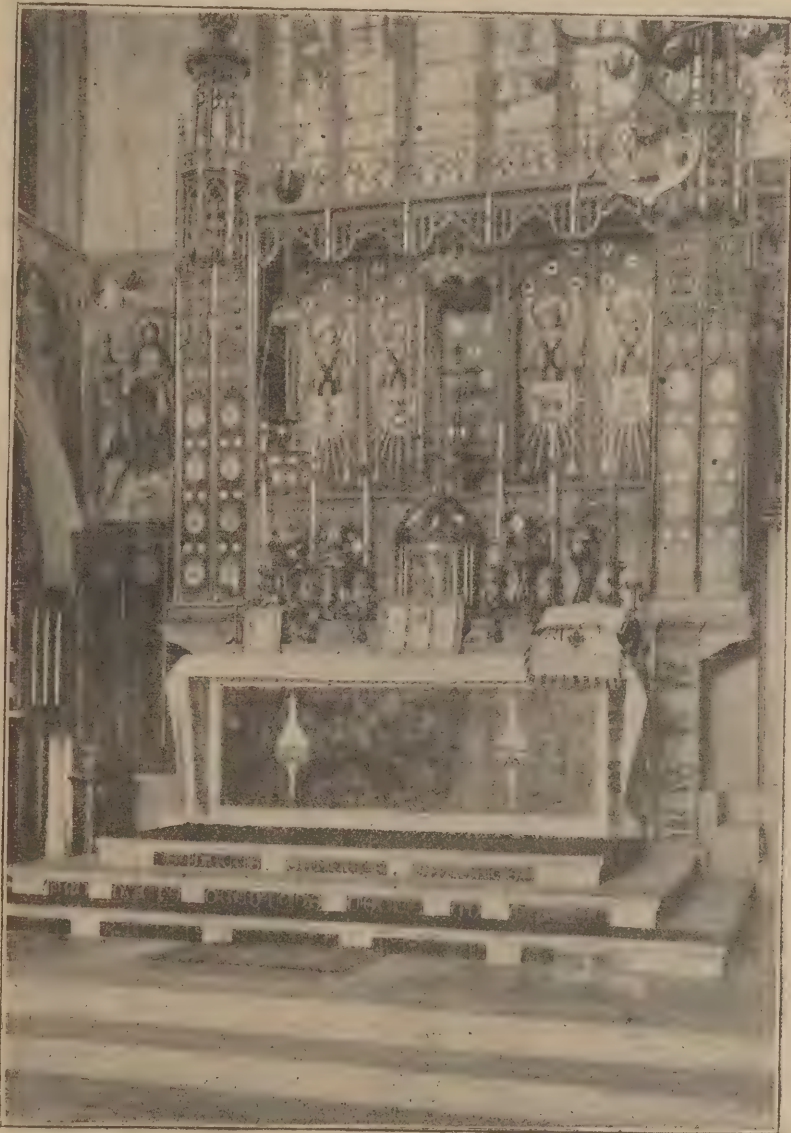
IN APPRECIATION BY HALSEY RICARDO.

THE loss of Mr. Bentley, at the age of sixty-two, is perhaps the heaviest blow that could be struck at the architectural world of to-day, for whilst there might be expected many more years of work from a man of that age, he had already, by the works he had done, proved himself one of the ablest architects of our time. The time that he had spent in practice was considerable; and the experience he had obtained from it quite remarkable; indeed, until one came to see the way he built up and assimilated his experience, it appeared almost superhuman. A man of strong convictions, with a clear and retentive memory, he had a temperament both analytic and creative, with the thoroughness of the artist. He was the prophet—one may so describe him—on whom the mantle of Mr. Butterfield fell: both were strong individualists, both were men of unalterable conviction, of deep insight, of high aim, and the sincerity of their purpose burns through their work. Born a generation (nearly) later than Mr. Butterfield, Mr. Bentley had both the disadvantages and the benefits of his time, and the marks of them show themselves upon his buildings. He could not make old forms and old methods go so far as his predecessor. The England of his youth was widely altered from the land about which Mr. Butterfield roamed as a young man educating himself. The old was fast giving place to new: inventions of all kinds were displacing the traditional methods and ousting the old materials. The use of machinery was becoming universal and the *genius loci* had to fly, disparaged and ignored, into the few remote coverts left from the invasion of the railroad. He had to stand by and observe strange foreign erections grow up in his domain, calling themselves Gothic and claiming kinship with him and yet really more hostile to all that he called his own and considered devoted to him than the professed examples of the "correct" schools—those importations of learning and scholarship from over the seas, by men who set themselves to supplant him and erect another genius in his stead. In 1830, when Pugin started on his career as the champion of Gothic architecture, the protector and reconstructor of mediæval buildings, innumerable examples of actual Gothic work were dotted over the face of the country. Neglected, despised, cobbled and patched, put to perverse uses, there they stood, authentic in what they showed, with a world of authentic history spread over and cut upon the patient stones. In 1856 the case was widely altered. Most of these examples had been taken in hand, rescued from their long neglect, trimmed up, pared and returbished with the blind fervour of the anti-

quarian, and they stood there clean, fresh, and rehabilitated, professedly authentic—but authentic really no more. Freed from the age of the past centuries, and divested of the veritable history those centuries had brought, they presented a conjectural youth, unconvincing and uninformed. To the architect they had become silent, uninteresting.

On the other hand the great expansion of England was well under weigh, the era of science well begun. Social life was rearranging itself: new duties and new responsibilities were coming to the front: new agencies were at work: the very notions of time and space were being changed. By the aid of steam the utmost antipodes were only a calculable distance away: the voyage there could be determined to the day and punctuality demanded. By electricity, they were put within speaking

large treatment of concrete, brickwork and steel girders; much as it might be discerned in the great roads, harbour works and concrete constructions of the Romans. But the architect by his training could make no advance. What had been done he could copy—but for developments he had no warrant. Under the contract system it was impossible to make experiments: neither time nor his reputation permitted modifications as the work proceeded. The architect adopted for his own purpose the conclusions of the engineers, not so much as stepping-stones to further excursions, but as the piers on which he was going to place his edifice. The design of the building did not grow out of the construction, but was an added affair, often in conflict with the very principles of the construction. The position of the individualist architect consequently was this: to



CHURCH OF THE HOLY ROOD, WATFORD: ALTAR. THE LATE J. F. BENTLEY, ARCHITECT.

distance. Fifty years ago there seemed to be no limits to the benefits an extended use of machinery might not bring us, and a larger view of human relations obtained. Schools, libraries, hospitals grew up as a consequence of the great arterial system of railways permeating Great Britain. The conveniences of travel, of transport, of shipment, demanded wider knowledge, a wider grasp of consequences. New points of view presented themselves, new requirements—in architecture new methods of construction. This was soon found to be incompatible with the formulæ (as enunciated) of the revived Gothic, which only worked provided that all the building forms were kept carefully within the confines of precedent, and a revolt against these formulæ was the consequence. The spirit of Architecture was gone. It was not with the architects. To some degree it might be discerned amongst the engineers in their

acquaint himself accurately with the possibilities of the materials he was about to use and to confine himself to the use of those only which he had mastered. From the first Mr. Bentley's knowledge showed itself. His treatment of brick and stone has a peculiar stamp upon it that reveals himself. He does not treat brickwork as a bricklayer would who was laying the bricks of a house of his own devising—he does not heap up and shape stone as a mason would who was building as Robert Grumbold did at Cambridge—but he came as near to it, probably, as a man may who is not a bricklayer nor a mason. He brought to bear, besides his critical insight, a keen sympathetic intelligence and a patient enquiry into the nature of processes as well as of things. No detail was so small as to pass his eye unquestioned. Craftsmen rejoiced in his designs. Here was a man who knew how a thing should be done—

who could design a thing that should tax their abilities but not strain them—that should illustrate the qualities of their material, not disguise them. His working drawings were a pleasure to look at: they were beautiful even, as pictures, but their merit was their clearness and their thoroughness. So far as diagrams on paper can ever show what has to be done, his plans gave that information. He not only conceived the object made, he conceived it in the making and indicated on his drawings the intermediate processes. It is a noticeable feature on a drawing when it shows how the thing has come. But these definite sign-manuals on his finished work I take to be, in a sense, his limitations. The cathedral at Westminster, his largest work, is great, I will not say in spite of them, but its greatness is independent of them. As it stands at the present moment, the outside is virtually finished, the inside shows only the carcase. The contrast is instructive in many ways. The outside is encrusted with detail, with a profusion remarkable and, for a modern building of such a size, unparalleled. The detail is fresh and new to us, vigorous, full of thought and erudite, giving to the building the interests of surprise and novelty. But much of the detail is not organic: it has not grown out of the requirements of the structure or the conditions of the place, but has been inserted by deliberate contrivance. The importation is ingenious, scholarly, and shows a great knowledge of the handling of material—nevertheless they are accretions, not growths, and by the time the London weather has dulled the surface and eaten into the edge of them, they will have been relegated, as some items more, to the large heap of revived features in the Golgotha presided over by Style. Let us enter the cathedral. About us—to use rather an inflated expression—is construction in its majesty. We are in communion with a fine soul. This is Art—the Art of Architecture. Before us are the outpourings of passion, of reverence, of high aim, of faith. Constructive knowledge taught Mr. Bentley how to poise his domes athwart the nave; it could not suggest that he should pierce the dome over the sanctuary and lift the brooding twilight from off the high altar. But the suggestion made, constructive



CHURCH OF THE HOLY ROOD, WATFORD.



CHURCH OF THE HOLY ROOD, WATFORD.

knowledge showed him how to shape his domes, how to mass the brickwork in his piers and buttresses, so that the whole body (I cannot call it a carcase!) is a living organism. The great diapered lunettes that light the clearstory of the nave with their latticed tracery account for themselves as plainly inside as they showed their function on the exterior—outside they were the arches transmitting the weight of the domes to the buttresses, whilst inside it was the trellised void beneath them that counted as of such service, tempering the light into a particularly fascinating quality. One might take any of the great features of the interior and follow them up with increasing delight: the domes with their shell-like overcoats: the flat table-land on which they sun themselves: the galleries that thread their way through piers and division walls: the profusion and the economy of the brickwork—there is so much he has to tell. I wish that the architect had been laid to rest beneath the cupola that watches, mild-eyed, over the sanctuary. He had, to use Prof. Lethaby's phrase, "built his life into the church" and it seems appropriate that the building which holds his life should also hold his body after life.

The Roman Catholic Church at Watford is an example of Mr. Bentley's work, complete (except the tower) in all particulars. Outside it is a demure flint and stone building, making no pretension, clipt in middle, Exeter wise, by two small octagonal turrets. Entering, one is considerably surprised by the sense of size and the exceeding richness of the decoration. The east end is a mass of colour. All that stained-glass, painting, coloured and gilt carving, and woven hangings can do, is there. The effect is gorgeous. And yet the means used are very simple: the usual ingredients of carved and moulded stonework, marble shafts, &c., are absent or only occur most sparingly—but there is a nervous elasticity in the sparse stonework and the tense arches that reveals great knowledge and character. The exterior of the Priests' Seminary at Hammersmith is known doubtless to the majority of the readers of the BUILDERS' JOURNAL. Beaumont College, Windsor, is known to me only by photograph. It must rank in size and importance next to the cathedral as example of Mr. Bentley's work: but though it has his

handwriting unmistakably over it all, it does not, I think, show Mr. Bentley at his happiest. The entrance front stands self-conscious, ill at ease; the chapel comes as an adjunct at the side and not very comfortably either: nor does the building, until you come to the back of it, express clearly its purpose.

Mr. Bentley, as well as Mr. Butterfield, passed for Gothic architects in the world at large—they were called so, and considered themselves so; but they really were descendants of Inigo Jones: individualists who used Gothic forms in which to express themselves and akin to the mediæval builders only in their efforts to know the utmost yet ascertained about the materials they were using.

Much of the force of Mr. Bentley's work comes from the knowledge he acquired when on the scaffold and in the workshops, and one could hardly specify a better training for a young architect than what he gave himself. With this knowledge as basis, he was able to analyse and detect new departures and to digest or repudiate them, was able in some measure to create new advances, from his recollection of what has been done and knowledge of how things should be done. He had, as I have said, the artist's qualification of thoroughness, which enabled him to express himself and his message to his fellow-men. Gifted, shy, he stood apart from his fellow-craftsmen and the great world of the daily newspapers scarce knew of his existence. Substantially, when he died, his work was done; and he has been spared the pain of seeing the actual consummation of his work—he has lived with it finished in his mind's eye and that picture, the ideal that cannot be realised, he has taken with him into the grave.

JOHN FRANCIS BENTLEY, who died of paralysis on Saturday, March 1st, and was buried on Wednesday last at Mortlake Catholic cemetery, was born at Doncaster in 1839, the younger son of a numerous family. He was a typical Yorkshireman. As a boy he exhibited great taste for drawing and was particularly fond of talking to workmen about their work, especially masons' work. At this time he made from memory a model of old St. George's Church at Doncaster, which church was burnt down about 1852. Directly after the fire Sir Gilbert Scott took the matter in hand and rebuilt the church, and it was here that young Bentley was



CHURCH OF THE HOLY ROOD, WATFORD.

put in the clerk of works' office—more perhaps to keep him employed than for anything else; he, however, learned a good deal about the setting-out of masonry and similar work. In the 'fifties, when about sixteen, he came to London, being placed with Holland & Hannen, the well-known firm of builders, with whom he gained considerable experience. He afterwards entered the office of the late Henry Clutton, about whom it is interesting to note that he was the author of the first design for a Roman Catholic cathedral at Westminster. After working for several years in Mr. Clutton's office Bentley commenced practice for himself (in 1862) at 13, Southampton Street, Strand, at which time he joined the Roman Catholic communion. Of the numerous works which he afterwards executed the following are the most important:—

Roman Catholic Churches.—St. Francis of Assisi, Pottery Lane, Notting Hill, London, W. (baptistry, priests' house and altars). Corpus Christi, Brixton Rise, London, S.W. St. Mary of the Angels, Bayswater, London, W. (alterations, altars, stained glass, &c.). St. Charles Borromeo, Upper Ogle Street, Langham Street, Marylebone, London, W. (very fine altar). Rebuilt the Franciscan Convent at Notting Hill, London, W. Chapel and convent, Braintree, Essex. Chapel and convent, Taunton. St. John's College, Beaumont, Windsor (for the Jesuits). Ushaw College, Durham (altars and decoration in Lady chapel). Church of the Holy Rood, schools and priests' house, Watford, Herts (where Bentley executed everything—stained glass, sculpture, decoration, &c.). St. Thomas's Seminary, Hammersmith (Cardinal Manning gave this commission). St. Mary's Church, Clapham, London, S.W. (enlargements, very fine schools, altar, Lady chapel and exquisite stained glass). St. Mary's, Kensal Green, London, W. St. Etheldreda's, Ely Place, Holborn (organ screens, &c.). St. James's, Spanish Place, Manchester Square, London (four altars, shrine, &c.). St. Mary's, Cadogan Place, Chelsea, London, S.W. Westminster Cathedral, Cathedral at Brooklyn, New York (complete designs prepared: Bentley visited the United States about three years ago on this important commission).

Anglican Churches.—St. Botolph Without, Aldersgate Street, London (restoration and decorative work). St. Botolph Without, Bishopsgate Street Without (restoration and decorative work). New Church at Chiddingstone, Kent. Bolney Church, Sussex (restoration). St. Mark's Church, North Audley Street, Grosvenor Square, London, W. St. John's, Hammersmith (church designed by Butterfield—new chapel and organ by Bentley).

Domestic Work.—"Carlton Towers," near Selby, for the late Lord Beaumont (an unfinished house designed by one of the Pugins, transformed by Bentley, who designed all the finishings, decoration, furniture, &c.). House at Ascot, for H. Maxwell Stuart, Esq. Houses at Staines, Doncaster and elsewhere, including one—"Herrons' Ghyll," Surrey—for the late Mr. Coventry Patmore. The Archbishop's House, Westminster. Fountain at Saffron Walden, near houses by Nesfield and Norman Shaw.

Mr. Bentley left a widow and family of nine children.



CHURCH OF THE HOLY ROOD, WATFORD, HERTS. THE LATE J. F. BENTLEY, ARCHITECT.

Correspondence.

"Right to make Openings into Lane."

To the Editor of THE BUILDERS' JOURNAL.

LISCARD.

SIR,—Allow me to say that after forty years' experience, in such matters I entirely disagree with Mr. Johnson-Roberts's answer to the above on p. 12 of your issue for February 12th. In the first place, A has only had possession of his land for fifteen years, and the lane or passage in question, originally being part of the adjoining

only to the present owners of the estate, similar to an occupation road.

In the third place, the lane being still unadopted by the local authorities, the cost of keeping it in repair has to be borne by the present owners of the estate, who, having also paid for the cost of making the whole of the lane, can prevent A or anyone else from making an entrance into it; besides, the site of the lane itself may be included in the conveyance to each purchaser of property abutting on it, as is often done in the sale of such estates, with the proviso that each purchaser keeps his portion in proper repair. The estate having been sold on lease, the reversioners will have a say in the

Mr. Winter asserts that querist has no right of way through the lane by lapse of time or user (technically, "prescriptive right"). I never said he had. Mr. Winter's contention (if I understand it correctly) seems to be that the fact of an adjoining owner making a lane outside querist's boundary wall prevents querist from exercising his legal rights over that portion of his own ground which adjoins the new lane, by preventing him, for example, from removing portion of a wall erected and owned by himself and standing on his own ground. This proposition is decidedly untenable. If, however, querist asked me the further question, Could the opening or door so made be used as a means of ingress or egress to or from his premises through the lane?—I would answer, that depended on who owned the ground of which the lane formed a part, and whether it was still vested in its original owners or had passed to the local authorities. From querist's letter and the accompanying map I gathered the latter was the case. I then gave my opinion, with which, "if my inference" as to ownership is correct, I trust Mr. Winter will agree.—Yours truly,

W. JOHNSON-ROBERTS.

Books on the Cross.

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—*"Sunderland"* (see p. 29, February 26th) might procure *"The Masculine Cross, or a History of Ancient and Modern Crosses,"* which takes the reader back long before the Christian era and gives illustrations of the God Indra nailed to a cross, the Buddhist cross (much like our Calvary cross), and the ancient heathen Mexican cross, all dating from probably thousands of years before the advent of Christ. It also illustrates the (now called) Maltese cross, so commonly found upon ancient Assyrian monuments. Of the latter, anyone visiting the galleries of the British Museum may see life-size effigies in stone of the kings Samsi-Rammanu, B.C. 825, and Assur Naṣir-Pal, B.C. 880, both of whom have suspended from their necks and resting on their breasts sculptured Maltese crosses, each about 3in. in diameter.

"The Legendary History of the Cross" is a Dutch book printed and published by Veldener, A.D. 1483. It contains sixty-four curious woodcuts illustrating the whole story, traditionally believed to be that of the actual wood of which the Cross of Christ was made. This curious book was known in the language of the place as *"Boec van den houte"* (literally the *"Book of the Tree"*).

The most dreadful and perhaps the most costly of all the valuable books in my collection is entitled *"Triumphus Jesu Christi Crucifixi,"* printed by the Plantin Press at Antwerp in 1608. It contains exquisitely-engraved plates showing crucifixions in no fewer than seventy different ways—a most horrific book.—Yours truly,

HARRY HEMS.

Eastbourne Technical Institute Competition.

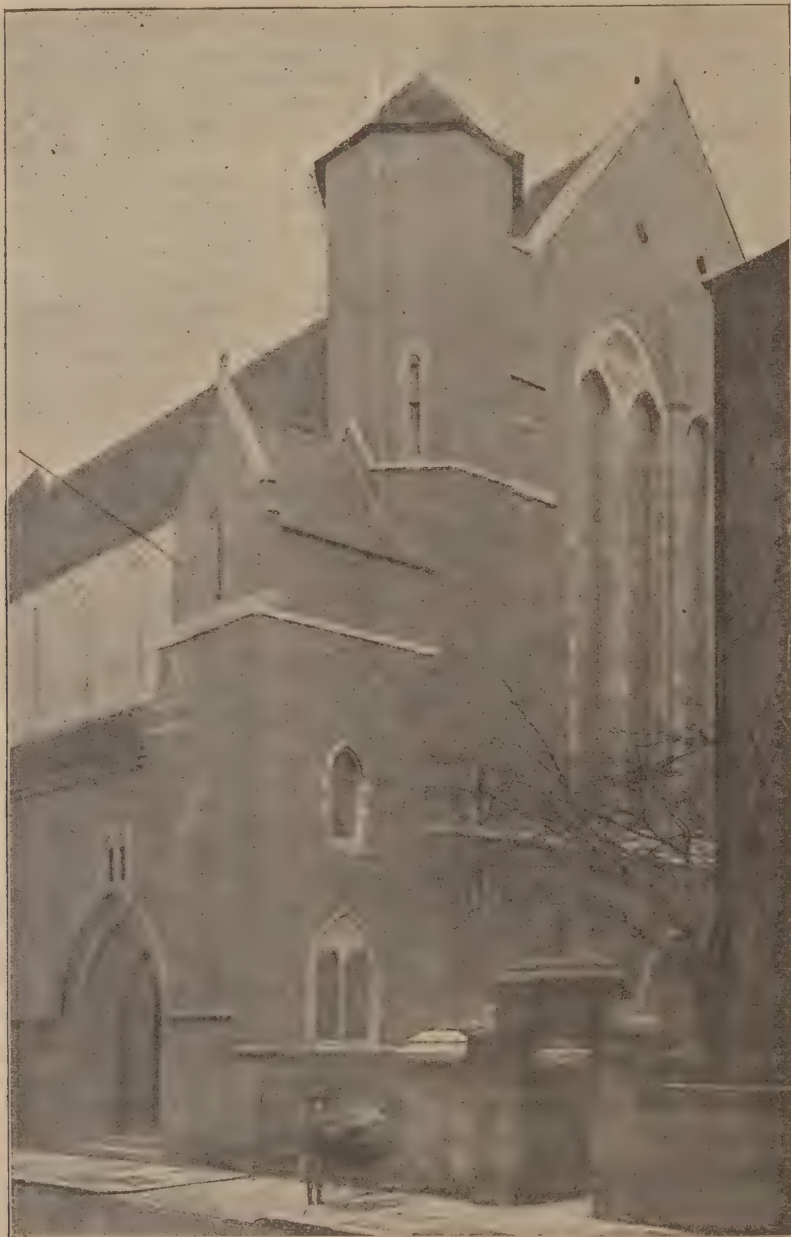
To the Editor of THE BUILDERS' JOURNAL.

SIR,—The conditions of the above competition strictly limited the cost of the buildings to £20,000, with an additional margin of 10 per cent. The result of the builders' tenders upon the first premiated design has just been published, and shows that the lowest tender received was £37,920 (see p. xvi of this issue). This is most unfair to all those who submitted designs in the competition, and as competitors we desire to enter a protest.—Yours truly,

COMPETITORS.

Royal Academy Exhibition, 1902.

The receiving day for architectural works is Thursday, March 27th. We shall be pleased, as in previous years, to receive drawings from intending exhibitors and to forward them (free of expense) to Burlington House. In order that careful reproductions may be made for publication, it is requested that drawings be sent as early as possible. No drawings can be received by us later than noon on the sending-in day.



ST. MARY'S CHURCH, CADOGAN PLACE, CHELSEA, LONDON, S.W.
THE LATE J. F. BENTLEY, ARCHITECT.

Photo: H. Irving.

estate, was not made or formed for "many years afterwards," and when so made was for the sole use and benefit of the estate and the property built on it, the cost of forming and constructing the lane evidently being borne by the original owners or purchasers of the estate.

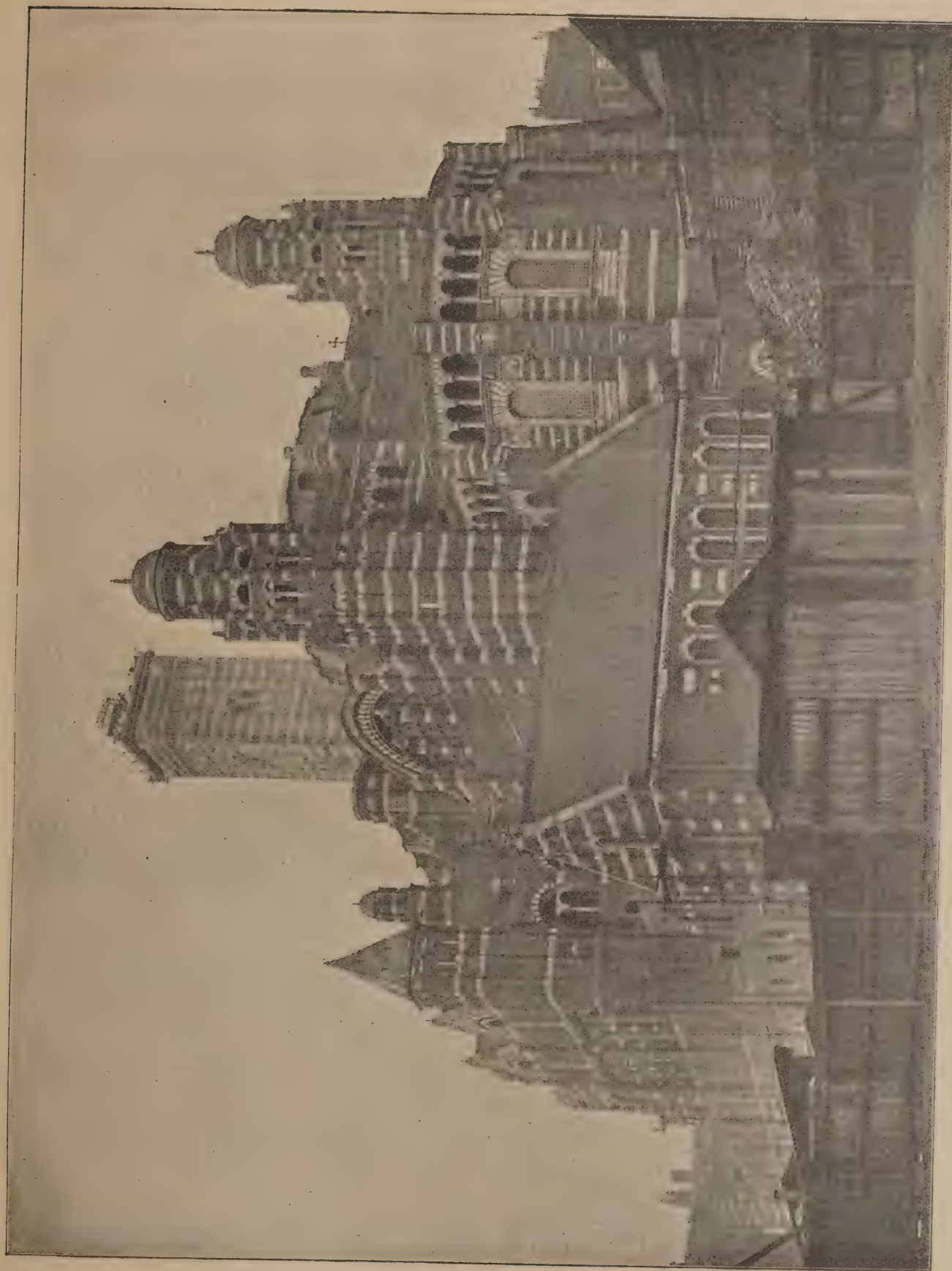
In the second place, the very fact of the lane remaining still "unadopted," and having been so recently made as "many years" after the commencement of the fifteen years mentioned, gives the public no right of way, although by courtesy the public have been allowed to use the lane up to the present time, but not long enough to claim a right of way by law. In fact, it is a lane or passage common

matter also, but no doubt an arrangement could be come to between all parties by A agreeing to pay half the cost of the construction of the lane so far as the same abuts on A's land.—Yours truly,

E. WINTER.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I have read Mr. Winter's criticism, but fear he did not read my answer with sufficient care. I stated: "I infer it (the lane) has vested in the local authority as a public thoroughfare or right of way. If my inference is correct (i.e., that the lane is a public thoroughfare vested in the local authority), I see no objection whatsoever to A making an opening in his boundary wall," &c.



WESTMINSTER CATHEDRAL FROM THE SOUTH. THE LATE J. F. BENTLEY, ARCHITECT.

L. Dickro.



MEN WHO BUILD.

No. 68.—JAMES MILLER, I.A.

IT is befitting, in view of the remarkable success of the Glasgow Exhibition buildings as a monumental architectural design, to review the work of the architect, Mr. James Miller. It is just twenty-three years since Mr. Miller entered the office of the late Mr. Andrew Heiton, architect, of Perth. At that time Mr. Heiton's work was both extensive and varied, for his practice was not confined to his own town or county but extended over the greater part of Scotland, so that Mr. Miller had excellent opportunity of gaining wide experience. After completing his articles with Mr. Heiton he spent several years in one or two Edinburgh offices, and eventually obtained an appointment in Glasgow from the Caledonian Railway Co. to prepare designs for several stations and other buildings on their system in the West of Scotland, where he remained till 1893, when he commenced practice on his own account in Glasgow.

For several of his first commissions Mr. Miller was indebted to the Caledonian Railway Co., they having entrusted him with the designing and carrying out of a considerable portion of the architectural work required in connection with the new Glasgow Central Railway. About this time he also received a commission from the Glasgow and South-Western Railway Co. to design their new terminal station at Princes Pier, Greenock (illustrated on p. 61 of this issue) and another from the Glasgow and District Subway Co. for their station in St. Enoch Square, Glasgow. The plan of the Princes Pier station is an interesting and instructive treatment of a difficult architectural problem; the curved inclined ways for luggage and goods well serve their purpose and lead to a good exterior.

It will be noticed that in much of his early work Mr. Miller was perforce associated with engineers—an association which from practical and constructional considerations he has found to be of the greatest value. He has a great admiration for engineers and their work, and understands their aims and methods. As Mr. Miller says, the engineer if he is anything is an exact man; he may not always "design in beauty," and as a rule he is frank enough to admit it; his first thought about his work is utility. It is this latter quality in the work of the engineer, thinks Mr. Miller, that architects should lay a little more to heart, for the vital element, as he expresses it, of all architectural design is utility. The word "utility" is somewhat misleading and is usually open to the interpretation

that it includes only our bodily and not our sensuous needs. It is here that the engineers fall into error, for they neglect generally to appeal to the intellectual pleasure as well as to the body. The essential of art undoubtedly is that it should express ideas, and pure engineering works are art-works in the sense that they are the product of thought and express that thought to those who are able to read these works, and the idea innate in an exact fitting to a purpose or the expression of an impulse or action gives beauty as in natural objects. Thus Mr. Miller believes that in their elements architecture and engineering are the same, what difference there is lying in the former adding what may be called the graphic or pictorial element to the latter, harmonizing all parts and appealing to the senses more directly. As an example of the beauty that is apparent in purely utilitarian works we may refer to the two views of the Glasgow Exhibition buildings in course of construction illustrated in our centre plates, which beauty will be apparent to any unbiased observer. The pleasure obtained is in proportion to the educated appreciation of the value of these works, and architects are often inclined to deny that beauty is existent in engineering works because engineers do not reckon to be artists or claim any beauty for them, but no unbiased critic with knowledge of their value can fail to see the beauty in these two views of the skeletons, if we may call them, of Mr. Miller's designs, which met with such praise when fully clothed.

Next to utility he is of the opinion that the architect should study his massing and proportion. It is a mistake to worry over detail while the general mass is wrong, for no amount of detail, however fine, can redeem a building which is essentially bad in its proportion or mass. The relation of this to what we have said in regard to utility will be apparent.

With what good effect Mr. Miller gave heed to this is apparent in his designs for the Glasgow Exhibition buildings and the Belfast City Hall dome (the latter was one of the three premiated designs selected by Mr. A. Waterhouse, the assessor, in a competition held three or four years ago). The dome of the former, it is evident, is founded somewhat upon the latter design, the grouping of the subsidiary masses being in essence the same.

It is hardly possible in these high-pressure days for a man to be an engineer and architect at one and the same time, and the man who attempts to do so will almost surely fail in one or the other or, what is more likely, in both. It is to be regretted that in this country the example of our Continental neighbours is not more often followed, where the engineer, architect and sculptor are frequently associated in carrying out works of public importance, with the happiest results, such as for example the beautiful Alexander III. Bridge over the Seine at Paris. Without such an association this wonderful monument could never have been produced.

About the time Mr. Miller commenced practice he was successful in gaining two local competitions, namely, Belmont Church, Hillhead, Glasgow, and Clydebank Burgh Buildings, including a town hall and baths (the former is designed in Early English Gothic, while the latter is a Renaissance building).

Mr. Miller has done a great amount of work, some of his most recent being Coupar Grange, Perthshire, for Mr. James Duncan, of London, and No. 6 Lancaster Crescent, Glasgow, for Mr. Alexander Moore, jun.; of this latter house we give several interior views.

Towards the end of 1898 Mr. Miller was successful in gaining the competition for the Glasgow International Exhibition Buildings in



NO. 6, LANCASTER CRESCENT, GLASGOW: HALL.



NO. 6, LANCASTER CRESCENT, GLASGOW: DINING-ROOM.

Kelvingrove Park, which were opened in May last year. An idea of the extent of work entailed in these buildings may be gathered from the fact that those erected from Mr. Miller's designs covered an area of between 60,000 and 70,000 sq. yds. The chief of them was the Industrial Hall, which was 700ft. long by 320ft. wide. The Machinery Hall was 500ft. long by 320ft. wide, and the provision of galleries running down the centre (see centre plates) was a most happy conception. The Grand Concert Hall was a circular building 140ft. in diameter and 80ft. high. It had a gallery which surrounded the whole building except at the part occupied by the platform, and accommodated between 4,000 and 5,000 persons. Built in connection with the Concert Hall was one of the largest restaurants in the grounds.

The Grand Avenue was 1,200ft. long and 75ft. wide, and connected the Industrial with the Machinery Hall. We illustrate this last in course of erection with its arched timber roof, cheap and thoroughly effective for temporary work. The proportions of the interior of this building could not be judged at the time the exhibition was being held, as the stands obscured a clear view and were so various in form, but we think our illustration enables one to judge of the vastness of the building and the grandeur and harmony obtained by using simple means.

These were the principal buildings connected with the exhibition, but there were about a dozen other buildings throughout the grounds of more or less importance designed and carried out by Mr. Miller. He also designed for Messrs. Wylie & Lochhead, of Glasgow, the suite of rooms in the exhibition known as the Royal Reception Rooms.

The first sod of the Exhibition buildings was cut in April, 1899, and the whole of the buildings were completed and opened on May 2nd, 1901, thus occupying just about two years in construction. For Mr. Miller to have performed such an immense amount of work with such excellence is remarkable; and more so when one considers the freshness and fertility of the details of the buildings. We need not refer further to the Glasgow Exhibition buildings, as we publish in this issue a paper on the subject read before the Architectural Association last week by Mr. Miller.

The following is a list of some of the principal works carried out from his designs or at present under construction:—

Belmont Church, Glasgow; Kelvinbridge Mansions, Glasgow; Clydebank Burgh Buildings, town hall, library and baths; Kelvinbridge

Station, Glasgow; Botanic Gardens Station, Glasgow; Glasgow and District Subway Station, St. Enoch Square, Glasgow; Craiguchty, Aberfoyle; Princes Pier Station, Greenock; Bridge of Weir Schools, Renfrewshire; house for Mr. John Kyle, Ayrshire; Coupar Grange, Perthshire; additions to Peebles Hydropathic, Peebleshire; house for Mr. Alexander Moore, jun., Glasgow; additions to Central Hotel, Glasgow; commercial premises, Union Street, Glasgow, for the Caledonian Railway Company; stable offices at Wemyss Bay for the Hon. Misses Burns; Glasgow International Exhibition Buildings. Several of these will be found illustrated in this issue. He has also been appointed architect for the reconstruction of the Royal Infirmary, Glasgow at a cost of about a quarter of a million sterling.

ARCHITECTURAL ASSOCIATION.

MR. MILLER ON THE GLASGOW EXHIBITION BUILDINGS.

A MEETING of the Architectural Association was held on Friday evening last at 9, Conduit Street, W., the chair being occupied by the president, Mr. W. H. Seth-Smith. After the minutes of the last meeting had been read and confirmed, the following were elected members of the Association:—S. Leaning (London, S.W.), E. G. Besant (Cambridge), R. O. Constant (Wimbledon), T. F. B. Pittar (Putney) and B. Procter (London, W.). It was agreed that a letter of sincere condolence be sent to the family of the late Mr. Bentley. The president announced the following additional donations to the New Premises Fund:—

	£	s.	d.
W. Howard Seth-Smith (second donation, making £100 total) -	50	0	0
A.A. Day School Students -	13	0	0
Henry Muff -	10	10	0
J. Olmud Scott -	10	10	0
G. Sherrin -	10	10	0
L. A. Shuffrey -	10	0	0
W. Hilton Nash -	5	0	0
E. B. Muff -	2	2	0
T. Frank Green -	2	2	0
Rowland Plumbie (provisional promise)	100	0	0
	213	14	0
Donations previously announced	3,731	1	6
Total	£3,944	15	6

A vote of thanks was passed to the Pearce Portland Stone Co. for presenting to the Day School seven cubical blocks from the different beds of Portland stone formation, and to Mr. A. Brumwell Thomas, through whose kind offices they were obtained. Mr. James Miller then read his paper on the buildings of the Glasgow International Exhibition, 1901, which was illustrated by numerous drawings, photographs and lantern slides.

Mr. Miller said that in Chicago and the several Paris Exhibitions the symmetrical or axial plan had been adopted, and he was of opinion that, wherever it was possible, this was the finest and grandest form. In Glasgow, however, the site precluded the adoption of such a plan.

It was the architect's intention to have placed a great central feature in the form of a monumental fountain 60ft. in diameter, surrounded by a row of columns 40ft. high, each column supporting a gilded winged figure, with a great circular illuminated tower 120ft. high rising from the centre of the fountain; but this was never carried out. Kelvingrove Park is studded with fine trees, and it is interesting to note that



NO. 6, LANCASTER CRESCENT, GLASGOW: DINING-ROOM.



not one of these was sacrificed. Many of the smaller buildings were introduced long after the original plans were matured, which explains in a measure the somewhat irregular arrangement in certain parts of the grounds.

Having thus roughly outlined the principal features of the site, Mr. Miller proceeded to describe the buildings in detail.

The piers carrying the dome of the Industrial Hall were constructed of wood up to the level of the external platform, 60ft. from the floor, the dome itself being formed of steel ribs placed at

about 14ft. centres, connected at the top with a braced steel ring of sufficient weight and strength to carry the fleche. The internal surface of the dome was covered with fibrous plaster moulded to the curve and nailed to $\frac{3}{4}$ in. boarding fixed to the purlins, the slabs having a finishing coat of putty lime $\frac{1}{4}$ in. thick, as on the external walls. On the outside was fixed $\frac{3}{4}$ in. boarding, covered with a smooth-surface floorcloth, this being the cheapest and most suitable material that could be found to take the gilding with which the dome was covered. Various materials

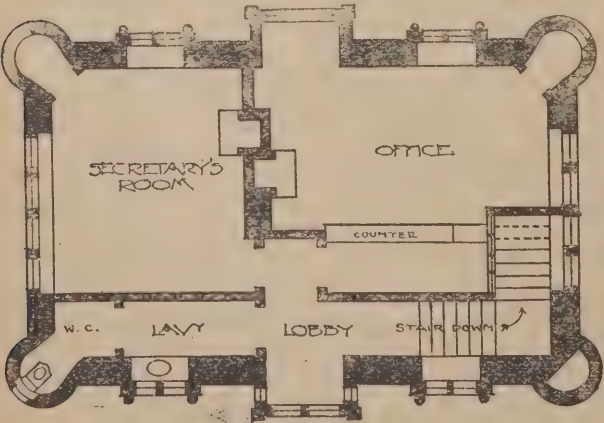
for the gilding were experimented with. Real gold leaf was too costly, and various lacquers and imitation gold-leaf were tried, but these soon became black in the chemically-charged atmosphere of Glasgow. The most satisfactory material was found to be aluminium leaf covered with a yellow lacquer, which gave an effect resembling real gold at about 1s. 10d. per sq. yd., but even this as a lasting material fell far short of the real article.

Mr. Miller next described the four great towers surrounding the dome, which were of wood faced with fibrous plaster slabs, 4ft. by 3ft. and $\frac{1}{2}$ in. thick, nailed direct to the timber framing. A space of about $\frac{1}{4}$ in. was left at the joinings, and the outside entirely floated over with a finishing coat of stucco, $\frac{1}{2}$ in. thick, squeezed through the joints.

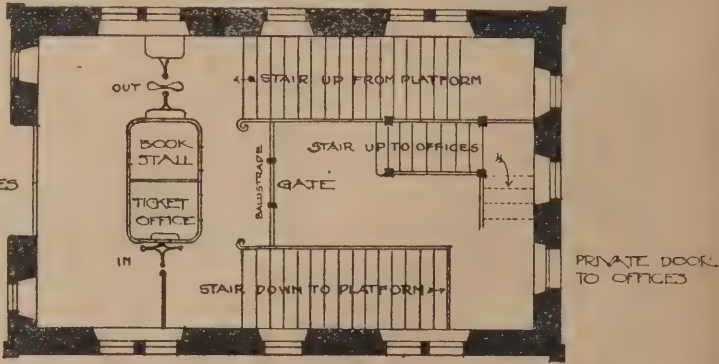
The lecturer next described in detail the construction of the roof over the main central avenue of the Industrial Hall. The corrugated iron used was No. 24 B.W.G., not galvanised, but dipped in linseed oil, it being intended to be painted; but, whether painted or not, Mr. Miller's experience was that all corrugated iron should be galvanised, even for temporary work which was to be painted, for, if not galvanised, the thin sheets very soon corroded. Galvanising also had the advantage of increasing the strength of the sheet, making it equal to an extra gauge in thickness. With regard to the lighting, the area of glass in proportion to floor area in this and the other buildings was as 1 to 2; in other words, 50 ft. super. of glass to every 100 ft. super. of floor area.

When circumstances permitted, Mr. Miller considered that a more even and better diffused light was obtained when that part of the roof next the ridge was glazed, instead of having the roof covering here and the glazing lower down. If the roof were of a very wide span a second stretch of glazing might be introduced lower down, but the largest section of glazing should be at the ridge. It was important that glazing, i.e., putty glazing, should be done in dry weather. In frosty weather it was dangerous for the workmen engaged on the roofs, and in wet weather the putty did not adhere to the astragal, leakage resulting, and nothing short of taking out the glass and re-glazing would make a satisfactory job. For these reasons every opportunity of dry weather should be taken advantage of to get the roofs glazed. The autumn preceding the exhibition year was perhaps the best time to get the glazing done.

In most of the exhibitions held in this country the floors of the industrial section were usually formed with battens 3in. thick laid with a space of about $\frac{1}{2}$ in. between the planks. At Glasgow, however, the floor of the Industrial Hall was laid with ordinary 1 $\frac{1}{2}$ in. boards tongued and grooved and laid close, facilitating cleansing and being more fireproof. Where there was a space beneath the floor it was advisable to cut the area into sections by means of brick walls

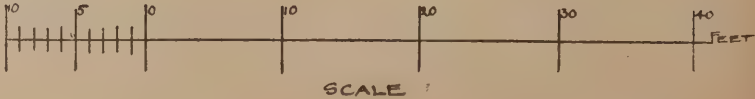


PLAN OF UPPER FLOOR



PLAN OF GROUND FLOOR

ST. ENOCH STATION, GLASGOW.
JAMES MILLER, I.C.E., ARCHITECT.



carried hard up to the under side of the flooring.

Mr. Miller referred to the following points to be considered in designing such a building as the Industrial Hall.

The gutters of the main roofs should be of ample section, with good falls, and ample provision should be made for down pipes to carry the water off. In a temporary building there was always a tendency to underdo rather than overdo such matters as these; yet more damage might be done by a heavy fall of rain in half an hour than all the extra cost of having proper gutters and sufficient conductors. For long straight gutters sheet-iron answered the purpose very well. It should be well bolted at the joints with a layer of canvas dipped in red lead inserted. For flashings, dome coverings and awkwardly-shaped gutters the best material was undoubtedly lead, say 4 lbs. to the ft. It was more easily worked to suit the various positions and awkward corners than either sheet-iron or

zinc; and, although the first cost was more, it would realise about two-thirds of its original cost when the buildings were demolished, so that the ultimate figure would not be much in excess of sheet-iron or a good class of felt when the painting of these latter was taken into account.

Every precaution should be taken against fire. As a general rule, it was better to use larger scantlings and fewer pieces than smaller sections with numerous parts.

Mr. Miller next described the Machinery Hall, the floor of which consisted of 9in. by 3in. battens laid close together and resting on cross runners 11in. by 3in., laid flat at 4ft. centres. Pipe channels were required under the floor and these should measure about 3ft. 6in. wide and about 5ft. deep, so as to allow a man to walk along and make the various connections or repairs to pipes. Parts of the flooring should be made movable at convenient intervals to give access to the ducts.

As to the ventilation of a machinery hall,

nothing short of mechanical ventilation was of any use, and a system of exhaust fans, sufficient to change the air in the building every fifteen or twenty minutes, should be provided to make the building at all comfortable in hot weather. The flooring over the ducts containing the hot pipes should also be insulated with some non-conducting material, as the boards soon become so hot as to make them uncomfortable to walk on.

After dealing with the boiler and dynamo houses and the lavatory accommodation, Mr. Miller described the Grand Avenue which connected the Industrial Hall with the Machinery Hall. The roof was of wood, and formed of laminated arch principals placed 14ft. 6in. apart, connected by 8in. by 2in. purlins, the arch consisting of three thicknesses of 7in. by 1in. pieces. In a roof of this kind the material used was so light in scantling that the downward thrust of the weight on the roof must be kept rigidly in a vertical plane, for if the arch buckled, which it had a tendency to do if not carefully made and



GLASGOW INTERNATIONAL EXHIBITION, 1901: THE INDUSTRIAL HALL, SANDYFOLD STREET ENTRANCE. JAMES MILLER, I.A., ARCHITECT.



DESIGN FOR NEW CITY HALL, BELFAST. JAMES MILLER, I.A., ARCHITECT.

put in position, it became an extremely weak truss, and would gradually go from bad to worse. The principals should be constructed on perfectly level ground, or preferably on a platform; the joints of the laminations should be cut true and joined tightly. Special care should be taken when erecting to keep the trusses flat, by poles bound from side to side.

The structural work of the Concert Hall was of steel. The steel principals were placed at 18ft. 6in. centres at the outer circumference of the circle, and were supported on two circular rows of steel columns, the inner and outer rows being 12ft. 6in. apart. The roof was saucer-shaped, and rose to 62ft. above the floor level at the centre. Externally it was covered with McIlwraith's canvas decking, a material having a smooth surface somewhat like linoleum, forming a very suitable surface for paint, and keeping longer clean in a smoke-laden atmosphere than canvases or felts of a rougher texture. It should be nailed with copper tacks, placed about 1½in. apart; ordinary tacks, even for a temporary purpose, should be avoided, as they rust and break away, causing leaks and discolouring the roof.

The Concert Hall was the only building in which a system of heating was introduced. As in most round buildings, there was a tendency to echo when but sparsely filled. A system of festooning hung from the ceiling was adopted, which, to a great extent, obviated the defect. The interval of the echo increased as the centre of the building was approached by the speaker, the longest interval being when the speaker was immediately under the apex of the roof—a position, of course, which was never occupied in practice.

In speaking of the artificial lighting of the various buildings and the grounds, Mr. Miller said that electricity was the only illuminant which should be used for the inside lighting of exhibition buildings, and there could be no doubt as to the decorative superiority of incandescent over arc lamps. Of course, to produce the same illumination the former required much more current than the latter; but in most of the large exhibitions a considerable amount of the lighting plant was supplied gratis by exhibiting firms. Throughout the grounds several systems of lighting were adopted, chiefly electricity, compressed gas and compressed oil.

In conclusion Mr. Miller dealt with the cost of the buildings.

The Industrial Hall cost about £60,000, or at the rate of 1½d. per cub. ft. (cubing the building from the ground line to half-way up the roofs), or equal to £2 8s. per sq. yd. of covered area. The Machinery Hall cost about £22,000, equal to ¾d. per cub. ft. or about 16s. per sq. yd. of

covered area. The Grand Avenue, where no steel was used in the construction, cost £9,300, equal to ¾d. per cub. ft. or £1 2s. per sq. yd. of covered area. All its walls were, however, more expensively finished than those of the Machinery Hall. The Concert Hall cost £12,600, equal to 2½d. per cub. ft. The various restaurants and kiosks throughout the grounds, which were built entirely of wood and plaster, ranged in price from £400 to £5,000, the price per cub. ft. of the more ornate being 2d. and of the plainer types 1½d. per cub. ft.—A discussion followed.

Engineering Notes.

Mr. Bryan Donkin, vice-president of the Institution of Mechanical Engineers, died last week. He was born in 1835.

The New Workhouse Infirmary, Richmond, Surrey, is being warmed and ventilated by means of Shorland's patent Manchester stoves with de-

scending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

The last pile in the new Britannia Pier at Yarmouth was driven last week. The pier, which is over 800ft. long, is constructed partly of iron screw-piles, the sea-end resting on logs of Australian karri wood 70ft. long. The work has cost £70,000.

Ventilation of the "Tube."—As an outcome of the recommendations of Sir Benjamin Baker, steps have now been taken to bring about the efficient ventilation of the Central London Railway tunnels. A fan has been placed at the base of the lift shaft at Bond Street station to remove the vitiated air, fresh air taking its place by passing down the shafts at the various stations under the ordinary atmospheric pressure. The fan, which is 48in. in diameter, electrically driven, is capable of exhausting the air of the tunnels in about three minutes. The intention is to work the fan every night after the trains have ceased running, and thus to obtain a thorough daily renewal of the atmosphere.

"THE STRUCTURE OF CEMENTING MATERIALS."

The tables given below were received too late to be included with the article printed in last week's issue. Reference was made to them on the first column of p. 45.

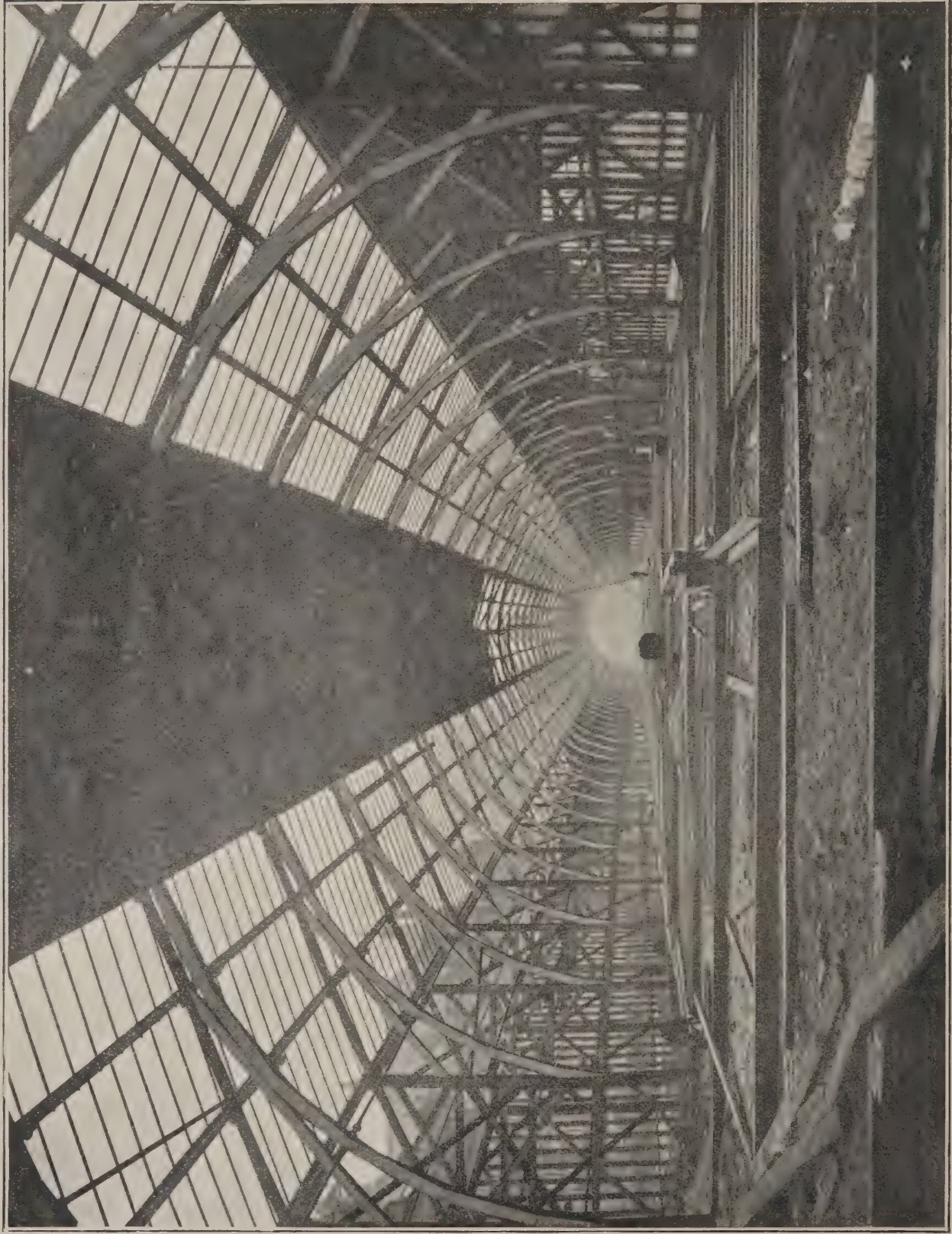
Composition of Portland Cements (English). (From Butler).

	Thames (Essex).	Thames (Kent).	Hull.
	Per cent.	Per cent.	Per cent.
Water and carbonic acid - - -	1.40	2.05	1.65
Insoluble matter - - - - -	—	.77	.87
Silica - - - - -	23.30	21.72	21.17
Alumina - - - - -	5.85	7.83	7.35
Oxide of iron - - - - -	4.65	4.31	4.14
Lime - - - - -	60.90	60.79	61.94
Magnesia - - - - -	.90	1.00	.91
Sulphuric acid - - - - -	2.43	1.10	1.38
Alkalis - - - - -	.30	.43	.59

Composition of Portland Cements. (From Newberry).

	Dyckerhoff (German).	Germania (German).	Porta (German).	Empire (American).	Saylor's (American).	Sandusky (American).
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Lime - - -	63.75	66.04	62.28	64.00	62.79	64.19
Silica - - -	19.35	21.14	22.69	20.80	20.64	23.20
Alumina - -	7.60	6.30	7.30	7.39	6.93	7.03
Oxide of iron -	4.50	2.50	2.87	2.61	5.41	2.41
Magnesia - -	Not det.	1.11	1.08	Not det.	1.72	.97

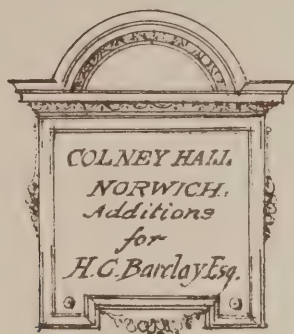
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GLASGOW INTERNATIONAL EXHIBITION, 1901 : GRAND AVENUE. JAMES MILLER, I.A., Architect.

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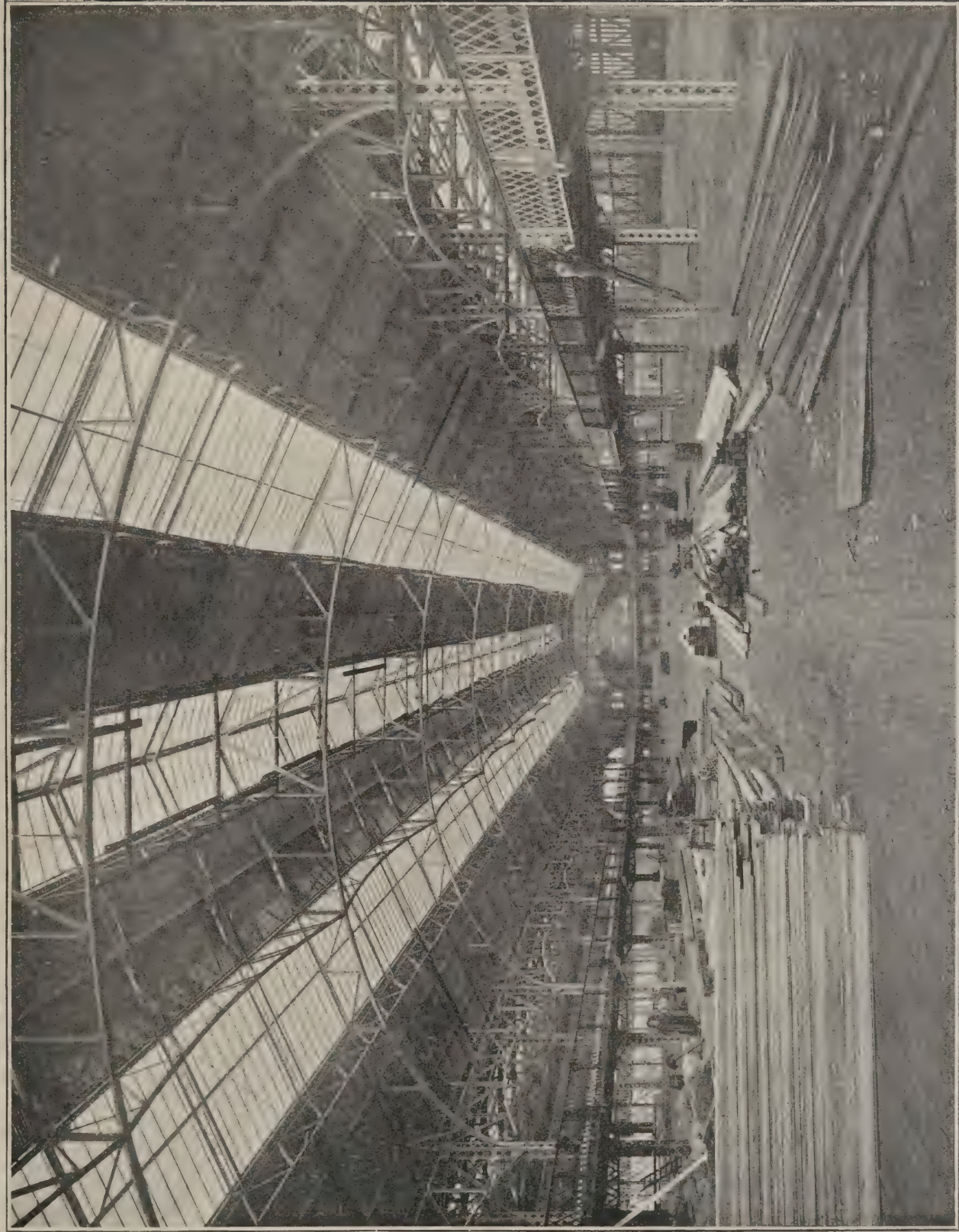




"INK-PHOTO." R. J. EVERETT & SONS, FOREST HILL, S.E.

F.R.I.B.A., Architect.

UNIVERSITY OF ILLINOIS



GLASGOW INTERNATIONAL EXHIBITION, 1901: CENTRAL AVENUE OF MACHINERY HALL. JAMES MILLER, I.A., Architect.

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Builders' Notes.

The Sheffield Building Trades Exchange is expected to be ready for opening about June next.

A Co-operative Builders' Association, on the labour co-partnership plan, has been started at Coventry.

The South Wales Building Trades Employers' Federation held a meeting recently at Newport, Mr. W. Thomas, Cardiff (president), occupying the chair.

Mr. George Howard, builder and contractor, of 52 and 53, King Street, Brighton, died recently at the age of sixty-seven years.

London County Council.—At last week's meeting of the Council a long discussion ensued on the adjourned special report of the Local Government and Taxation Committee dealing with the report of the Royal Commission on Local Taxation. An amendment exempting hospitals from rating was carried by a small majority.—Dr. Collins presented a petition from the owners and occupiers of properties in St. John's Wood protesting against the proposal to erect in Grove End Road and on either side of Warwick Place large blocks of dwellings for the working classes.

The British Institute of Certified Carpenters visited the engineering works of Mr. F. W. Reynolds in Blackfriars Road last Saturday. Specimens of various parts in joinery were put through the machines. One of the mortice machines had an arrangement at the side for boring, and by revolving the handle the chisel came into position, and by repeating again the core-driver was moved into place. A fire-wood splitting machine shown should come into use for lath rendering. A mortice machine for the box of carriage-wheels was inspected. By an arrangement at the side the box is divided into the number of spokes required, and the bed of the machine can be tilted to suit the side splay of the spokes. Many other appliances were exhibited.

Female Labour in the Brick Trade.—An experiment is being made by some of the brick-making firms in the Black Country with a view to the abolition of female labour in the brick trade. Such labour should never have been employed.

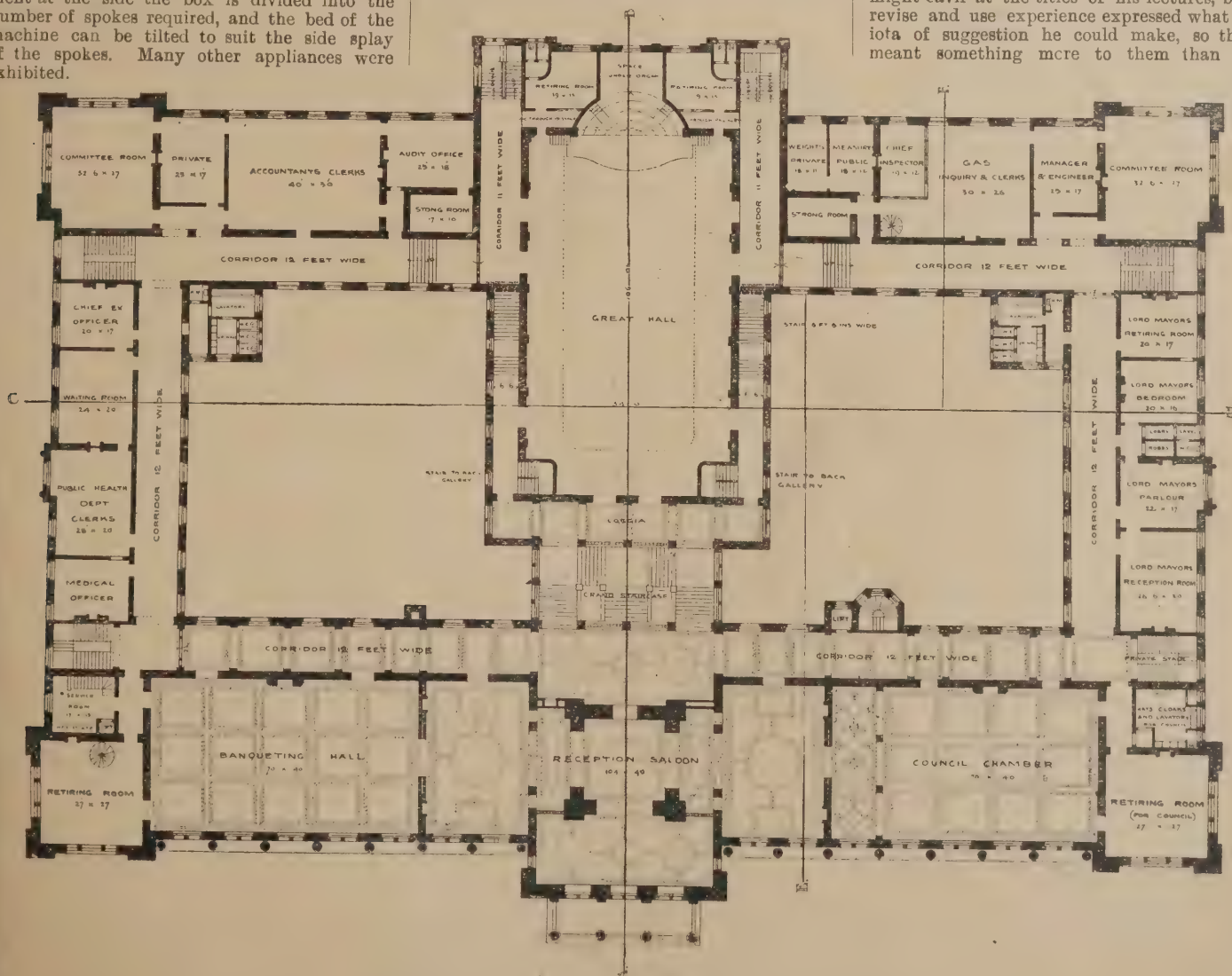
The Worcester Master-Builders' Association held its annual dinner recently, Mr. J. S. Wood presiding. Mr. J. Stokes in proposing "Success to the Midland Federation of Master-Builders" referred to the "go easy" doctrine. It had been elicited at Newcastle, he said, that during six years bricklayers' wages had increased 14 per cent, but the output had decreased 33 per cent. When he came into the trade he carried bricks, nine at a time, all day; now labourers took eight and stood five minutes between each journey. Thousands of ready-made doors were imported every year which could as well be made in England if the joiners would put their best days' labour into it. Builders were harassed by disputes among the workmen themselves. Bricklayers and plasterers said each were doing the others' work, and the masters had to measure the size of tiles to decide. The chairman proposed "The Architects," and said builders were desirous of seeing quantities forming part of contracts, and he hoped the architects would use their best endeavours in that direction. The Builders' Federation had now under consideration the general form of contract which they hoped will be adopted throughout the country. It would give the builders an opportunity of appealing when they considered they were unfairly dealt with. Mr. A. B. Rowe in reply said architects felt they were one with builders, because they naturally felt the stoppage of building owing to the strikes of men. The architects appreciated the many difficulties with which builders had to contend, and would as far as possible act fairly with them without detriment to their clients. The fluctuations of the labour market and the price of materials had rendered the lot of the contractor anything

but a happy one. With regard to quantities, the architect guaranteed them and should always see that they were included in contracts. Mr. Calkin, the city engineer, thought quantities should form part of every contract.

MR. ALFRED GILBERT'S ADDRESSES ON SCULPTURE.

MR. ALFRED GILBERT'S third address at the Royal Academy was to all intents and purposes a sermon with "Creation" for its text. Two great artists who seemed to him to him to come nearest to the worship due to the Viceroys of a great Providence were Phidias and Turner. In music and in other arts he might find individuals as strongly marked. But music, though a giant to-day, is but a baby in the history of art; and with architecture it could not be said that one master-mind built this or that famous cathedral—it was the work of many men all working to create for an end which they could not explain. Mr. Gilbert instanced Memling's work for the hospital of St. John at Bruges as that of a man impelled and spurred on to create by some unknown force working within him. Memling came back from the Burgundian Wars suffering from the plague, and when the sisters of the hospital had nursed him back to life he asked at once for his brushes and colours that he might offer the nuns "some little of my God's gift as a recompense for their kindness." He stayed with them six years, and accomplished those examples of handicraftship and mind that can only be described as stupendous, coming as they did from a rough, raw soldier.

In his fourth lecture—"Revise and Use"—Mr. Gilbert said that in six lectures of an hour each he could not teach practically what he had spent thirty years over, and in which he still found himself a child. Purists of language might cavil at the titles of his lectures, but to revise and use experience expressed what poor iota of suggestion he could make, so that it meant something more to them than mere



FIRST-FLOOR PLAN, DESIGN FOR NEW CITY HALL, BELFAST.

"repetition" of a subject. In striving for the school prize they should neither think they were made if they won it, nor hopeless creatures if they lost it, for the immature children of fifteen who carried off prizes were not actually in advance of older students; they were really running neck and neck, for cramming in Art was as hollow as that in Letters. Art appealed to individual natures according to how those natures were developed, and he instanced Burne-Jones and William Morris, both of whom were past twenty-three when Art called them seriously. Though no Michael Angelo or other great genius lived now, there was their teaching left, and this "experience" was for the students' revision and use. Mr. Gilbert said nothing could be more cheap than the chance designs of book covers and for *ex libris*, and he amusingly illustrated a chance design of this character. A fluke would never outlive their own judgment; it was the cap and bells, while will-design was the crown with points. But there was an intermediary state which he could only describe as *attendu*; something which gave pause; for no sculptor quite knew what would

was "Experience," and he impressed on the young sculptors and painters that each year, each cycle, would make them more and more respectful to the work that had gone before them. The students before him had advantages that were possessed by students of no other academy, and they had opportunities of seeing examples of every kind of work. They might, perhaps, think that the work of some of the elder men was misguided, but he advised them never to criticise without thought what others had done with experience. Mr. Gilbert confessed that when he was a boy he thought little of this one and that one—he thought only of success in competitions and exhibitions. But, perhaps because his efforts were untruthful, he never had the faintest phantom of a success until he was past thirty, and then it came to him by the recognition of a brother artist—Leighton. Mr. Gilbert urged the students to make more use of the splendid art library which was at their disposal, for it was always a reproach to the sculptor that he did not read books. There was Cellini's "Autobiography," for example—an epitome of an artist's experiences. Mr.

make something let him recall the way in which similar subjects had been treated by other men—the men who had made tradition. Some artists would say that when they were trying to realise a particular thing they could not bear to see other work—it upset their ideas. But, said the lecturer, nothing was better than for students to see work that had been done by greater men. They need not copy it, but they might gather inspiration from the tradition that its maker had passed on to them. Above all let them take no notice of fads or new fashions in art. These should be left to the amateur or to the cheap-Jack who was seeking a short road to a spurious reputation. Turning to ambition, Mr. Gilbert said that he was touching on the biggest thing of all. It was the stirrup-cup of life, sometimes poisonous and sometimes sweet. The artist's ambition should not be to vie with what had gone before, but to make himself worthy to be classed with those who had done the great work of the past. His ambition should be to hand down the best—to leave something behind him. Mr. Gilbert then referred to a matter of great interest to the sculptor—the



COTTAGES, ABERFOYLE, PERTHSHIRE. JAMES MILLER, I.A., ARCHITECT.

happen ten minutes after he had begun. Mr. Gilbert could not say of himself that he was a fluker, but maybe he was *attendu*. Then he evolved will-design from the line of beauty, showing how discord might arise, but by revising and using it this became design of harmony. A given theme always resulted in greater originality than one happened upon. A sculptor could not set up a model and decide afterwards what it should be called. It was the will that would live. Sculpture, said Mr. Gilbert, was almost as complex an art as that of the master-builder, and no scheme should be undertaken that could not be thoroughly digested, revising and using the experience by which it was to be carried out. They might think it was easy to have a lump of clay and make a mud-pie of it and then a human head. He granted it was easy to make a head of some sort even out of a potato (and there were many heads that were potatoes), but he wanted the students to approach their art with loving care of experience, revised and used, and then they might let the rest go.

The keynote of Mr. Gilbert's fifth address

Gilbert showed on the blackboard how one of his nurses taught him, when about five years old, to draw a child's head on a foundation of four circles grouped together. This, and other similar examples, which were sketched later on the blackboard, were, he said, homely teachings done to amuse a little child. But he might tell them seriously that he had inherited that tradition, and even now he could never draw a child's face without making those preliminary circles.

The title of Mr. Gilbert's sixth and last address was "To a Proper End." Memory, he said, was a great factor in conveying an artist's work "to a proper end," and he urged the students to keep all their beautiful memories before them while working, and close the door on all the rest. If the artist's memory were charged with fine things he would destroy his bad or ugly work, at once recognising that it was not the proper end of his achievement. Let the sculptor try for the best. If his work was not good—and he ought to be able to judge for himself—let him break it up or it would break his heart. And he must respect tradition; and when he was trying to

committee. The young sculptor who accepted a commission from a committee in the ordinary fashion might find that he was not allowed a free hand. But he must make up his mind not to submit. He was an artist giving the use of his brains, but he should not allow himself to be told how to use them. And even after thirty years of work the sculptor was liable to be told that he was wrong, perhaps by someone who knew nothing. In conclusion Mr. Gilbert told the students that it was impossible that he should have taught them the practice of sculpture in these lectures. He had explained to them before that his task was to guide, not to teach. But if he had made them think, and exhorted them—not vainly—to read, he should go away a happy man.

The Estate of the late Mr. Onslow Ford, E.A., has been proved at £10,720 gross and £8,270 17s. 9d. nett. To the Royal Academy has been bequeathed such of the plaster casts of his work as they might select for exhibition, but such casts are not to be sold or reproduced.



PRINCES PIER STATION, GREENOCK. JAMES MILLER, I.A., ARCHITECT.

LINEAR PERSPECTIVE.

At a recent meeting of the Associate Section of the Edinburgh Architectural Association (Mr. J. Stuart Syme in the chair) Mr. Robert F. Sherar, of Mr. Peter L. Henderson's staff, gave an interesting lecture on linear perspective illustrated by photography. After briefly tracing the history of the science from the conventional representations of the ancient Egyptians to the finished realism of the Middle Ages, he said that the researches in the science as such had been practically exhausted by Dr. Brook Taylor and successive writers in the eighteenth century; however, it was always possible to improve on the methods of stating facts and of teaching. The lecturer condemned the confusion of ideas expressed by the somewhat ambiguous term "picture-plane," and then discussed a few questions arising perennially from this confusion. Among these questions was that of vertical parallel lines converging towards a vanishing point as they receded from a spectator. Having proceeded so far in a critical manner, he then described the different uses and applications of the science as an aid to the architect or painter, and with the aid of photographs taken for the purpose he very lucidly described the elementary conditions on which the science depended and was distinguished between the perspective appearance of objects as seen and the perspective image as drawn on paper. He showed two photographs of the same building taken from the same spot which were quite different in the perspective lines, and explained that they were both equally correct records of the perspective appearance as we saw it, but records only. To prove this he then showed a photograph of the first of these two pictures taken with the camera placed in front of it, so that its image fell on the left-hand side of the photographic plate instead of the right-

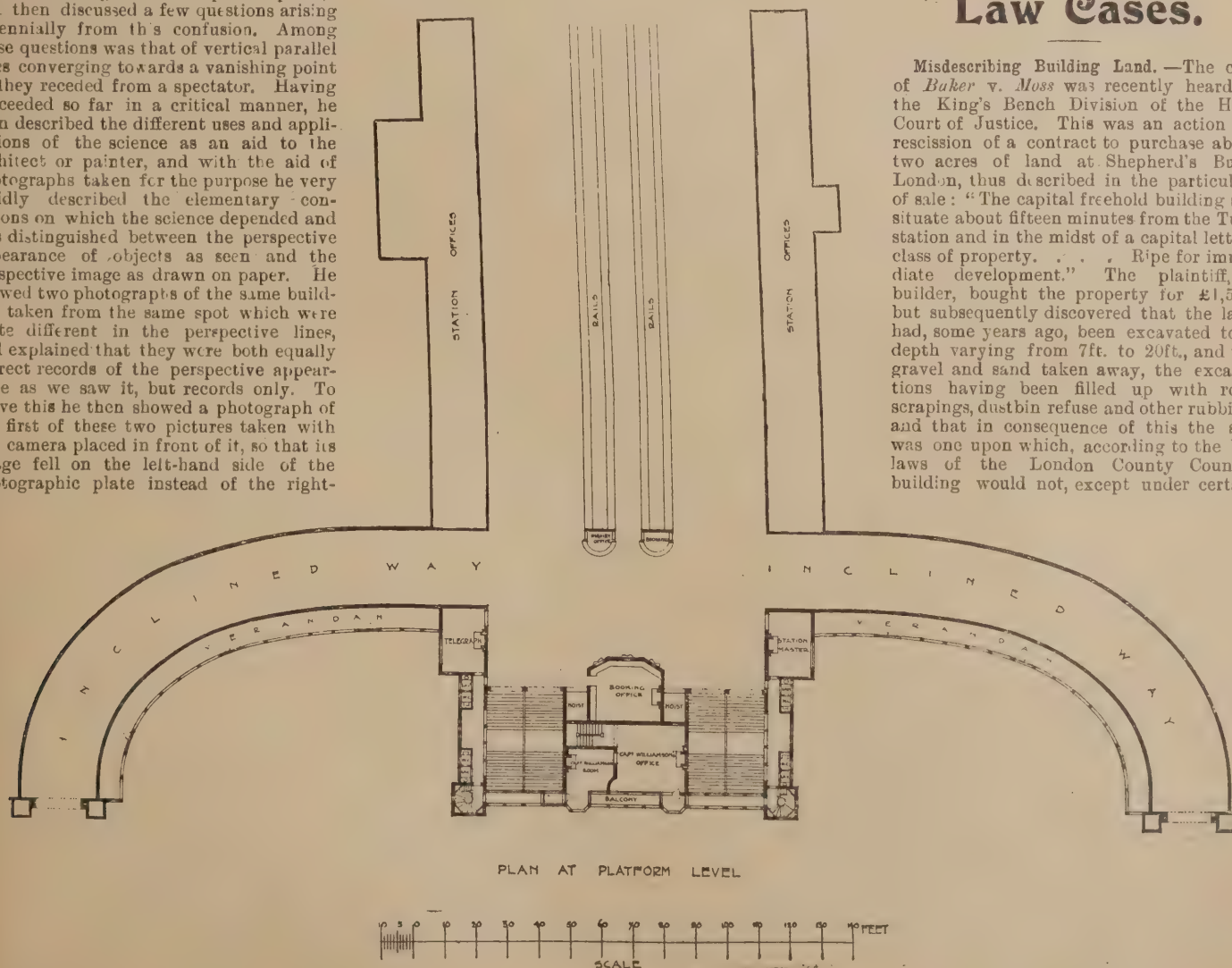
hand side, and the result was the same as the second picture. From this he laid down the rule that the perspective appearance depended on the position of the spectator, and on this only; and that the perspective image depended on the surface on which it was delineated, whether it was a picture-plane vertical or otherwise, or a picture curved as a panorama, &c.

In dealing with the distance a spectator should be from the object in order to produce an agreeable result, he showed three very interesting photographs of the east end of Princes Street with the Calton Hill in the distance, and said he had often heard it remarked that photography did not give correct perspective of distant hills, &c., as it always rendered them too small. The first photograph above referred to showed the Calton Hill about a quarter of

the height of the buildings, the second showed it the same height, and the third showed it twice the height. This, he said, all depended on the distance the spectator or photographer was from the objects to be represented. The choice of this distance was one of the most important preliminaries of picture-making, whether by photography or other means. He agreed with all the later writers on perspective that no rule could be laid down except in a general way in order to guide the artist, the conditions varying so much in each individual case. He laid great stress, however, on the fact that these conditions should be thoroughly understood, and said they were the very things that were not clearly defined in modern books on perspective.

Law Cases.

Misdescribing Building Land.—The case of *Baker v. Moss* was recently heard in the King's Bench Division of the High Court of Justice. This was an action for rescission of a contract to purchase about two acres of land at Shepherd's Bush, London, thus described in the particulars of sale: "The capital freehold building site situate about fifteen minutes from the Tube station and in the midst of a capital letting class of property. . . . Ripe for immediate development." The plaintiff, a builder, bought the property for £1,500, but subsequently discovered that the land had, some years ago, been excavated to a depth varying from 7ft. to 20ft., and the gravel and sand taken away, the excavations having been filled up with road scrapings, dustbin refuse and other rubbish; and that in consequence of this the site was one upon which, according to the by-laws of the London County Council, building would not, except under certain



conditions, be permitted. The defendant contended that the land was correctly described. The words used were understood to mean that, having regard to the state of the neighbourhood in which the land was situated, houses built on it could probably easily be let or sold. He further contended that, if the soil were excavated and proper foundations laid, the land could be used for building without contravening the by-laws of the County Council, and that the necessary excavations were no more than would be required for building basement houses on any ordinary land.—Mr. Justice Joyce said he had no hesitation in holding that there was in this case a most serious misdescription of the property. The land was practically useless for the purpose for which it was offered for sale, and for which the plaintiff bought it. The plaintiff was therefore entitled to the relief which he claimed.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Examination in Builders' Quantities.

BELFAST.—A. B. writes: "Where can I obtain the papers of past questions of examinations for builders' quantities promoted by the City and Guilds of London Institute?"

The questions set at the examinations of the City and Guilds of London Institute are published annually at about 1s. Apply to the Superintendent of Examinations, City Guilds Central Institute, South Kensington, London S.W. HENRY ADAMS.

Taking-out Quantities of Tracery Work.

BRADFORD.—J. P. D. writes: "Which is the best way to take out the stone and labour as per enclosed print of tracery and archstones (not reproduced)?"

The stone and labour should be taken out separately. The stone is measured at per ft. cub., taking the extreme size of the block out of which the finished piece would be obtained. Stone 3in. thick and less is measured per ft. super. and taken separately. The labours are best measured at per ft. super., taking to each stone the area of the bed and of one of the ends as "bed and joint," the superficial area of these including two faces to each, so that if it is taken to one face only the dimension will have to be halved. "Sunk joints" to the arch and "plain faces" should be stated. The mouldings are measured to their full girths. The circular convex and concave beds should be described as "circular bed or joint" and "circular sunk bed or joint" respectively. "Circular moulding" is used to describe either concave or convex. Take the trefoils separately. Number the mitres, stopping, &c., averaging the girths, and describe as "stopped." Number the dowels, including the mortices, and measure the grooves for glass per ft. run. A sketch must always be included in the quantities.

Arch over Fireplace Opening.

CO. KILDARE.—J. J. H. writes: "A fireplace is 3ft. 6in. between the jambs, and projects 14in. from the surface of the wall; the jambs are only 9in. wide on face. Would it be safe to turn over it an arch in two half-brick rings without an arch bar or stone lintel? The chimney breast would continue up to a height of about 20ft. by 5ft. wide."

It would not be safe to put an arch as suggested without a chimney bar, owing to a thrust, the small space available for skewbacks, and the narrowness of the jambs. HENRY ADAMS.

Liability to Repair.

BELFAST.—URGENT writes: "A has a twenty-five years' lease of a building which he uses as furniture stores: nineteen years of the lease have elapsed, during which period the owner (B) has not repaired the building, such repairs

being done by A. Owing to a settlement, or some other unknown cause, the rear wall of the building has cracked from the ground up to the eaves, and is in danger of collapsing. B says that as A has a lease of the building he will have to repair the wall. Is A liable for this, or only for all reasonable repairs over which he has control?"

In the absence of any stipulations respecting repairs in A's lease, A would be bound at the expiration thereof to deliver up the premises to the owner in the same condition as that in which he received them, reasonable wear and tear alone excepted. From the nature of the injury mentioned, and bearing in mind the suggestion querist makes that it is owing to a settlement of the ground, it is very probable that it existed in a minor and possibly not so noticeable a form at the time querist leased the house. If that were so, he is not bound to repair the damage; otherwise I am afraid that the owner may allege that the injury to the wall of the house was caused by the use querist made of the house or by some neglect on querist's part to have proper repairs executed. If the owner takes this position, querist will find it difficult to succeed against him, unless he can show that the crack in the wall arose from some cause which is outside querist's covenant to keep in good order. If querist will send me a copy of his lease, and tell me a little more definitely what is the cause of the cracking of the wall, I will advise him further. W. JOHNSON ROBERTS.

Ascertaining Quantity of Lime in Mortar.

BRACKFORD.—J. P. D. writes: "Kindly suggest an approximate method of ascertaining the quantity of lime in mortar for use on works in progress in lieu of the elaborate one of analysis by a chemist."

Lime is usually mixed with sand for mortar in the proportions of 1 bushel to 3, but the only accurate method we can suggest is to compare the quality of the limes (tested as described on p. 168 of our issue for October 16th last) with a standard one and use a proportionate amount in the mortar to that decided for the standard lime. Tests of all the best-known limes can be obtained from the text-books, and you can proportion them for the work in hand from the binding strength assumed in calculating the dimensions of the brickwork.

Claim for Defective Drainage Work.

YORKSHIRE.—KMORTS writes: "A. has some property which he required to convert into cottage property. Plans were prepared by the architect B., and the tender was let to contractor C. In the specification there is a clause which states that the lengths of the 4in. and 6in. drains are to be laid with clay joints and collared with cement outside the clay. This was done by the contractor C. and approved by the architect. About two years and six months after, A. engaged the contractor C. again, but refused to pay for the work then done on the ground that the drainage of the cottage property was defective. This he discovered by forcing water into the drain excessively. A. claims against C. for defective workman-ship, but C. disclaims all liability, as he says the work was done under the architect B., whom he considers is liable, if anyone is, as he specified clay joints collared in cement, which, in this case, have proved defective. Is the contractor right in his contention? He has sued A. for payment of his account and A. has put in a counter-claim."

I think the contractor has a just defence to any action brought against him by either the owner or the architect. He appears to have carried out the work in accordance with the specification and to the satisfaction of the architect. More than that, he was paid by the owner the full amount of his contract and extras. I certainly think that two years and six months after work has been passed and paid for is not the time to raise objections as to its quality. I do not see how the owner could set off or attempt to set off as against the contractor any claim, be it valid or otherwise, which arose in respect to an entirely different transaction. On the hearing of the action, the contractor should strongly object to the owner's case being heard by way of counter-claim. If the owner imagines he has any claim against the contractor he can proceed against him by separate

action. The work having been done by querist according to specification, to the satisfaction of the owner's architect, being paid for, and having proved satisfactory for nearly three years, I cannot see how failure to stand the "test" mentioned (which in all probability caused the injury complained of) gives the owner any right of action. If the case is properly put before the judge, I fail to see how the owner can recover one penny. W. JOHNSON-ROBERTS.

Height of St. Paul's Cathedral.

LONDON, S.E.—G. A. A. writes: "What is the height of St. Paul's Cathedral (a) from the pavement level to the top of the cross, (b) from the foot of the foundations to the top of the cross, and (c) from the pavement level to the top of the external dome?"

(a) 370ft. (b) We do not know the depth of the foundations. (c) 285ft.

Rendering Partition Noise-Proof.

LONDON, W.—G. J. M. writes: "How can a matchboard partition lined with sawdust be made noise-proof? It is not so at present."

We advise you to remove the sawdust from the partition and fill it with slag wool, and put two thicknesses of heavy canvas on each side.

Cleaning Marble Slab.

HEXHAM.—WESTFIELD writes: "How can I clean a marble slab in a butcher's shop window which has become stained?"

Brush the surface with strong hydrochloric acid, commercially known as muriatic acid or spirits of salts.

Perspective.

TORQUAY.—E. C. writes: "What book on architectural perspective do you recommend for a beginner? I want a cheap one."

"Linear Perspective," by G. A. T. Middleton (B. T. Batsford, 1s.).

In reply to "C. L. G.," who sends a similar enquiry, a series of articles on perspective appeared in our issues for October 28th, 1896, November 4th, 1896, March 3rd and 17th, 1897.

Cloth for Vapour Bath.

LANCASTER.—A READER writes: "I have been asked to make a vapour bath, but do not know with what material to cover the framework. Can you suggest something?"

The cloth used is a heavy canvas treated with a composition similar to that used for making oilcloth. It can be obtained from Messrs. Piggott & Co., Bishopsgate Street, E.C. There are also several other manufacturers of these cloths for vapour baths.

Japanning Stoves.

BIRMINGHAM.—HAMSTEAD writes: "Kindly give the name of a book on the construction of japanning stoves and small brazing hearths for use in a hardware factory. Is there any useful article on the subject?"

We do not know of any book on japanning stoves or brazing hearths, but Spon's "Workshop Receipts" contain articles on japanning and brazing.

"The Tower of the Winds."

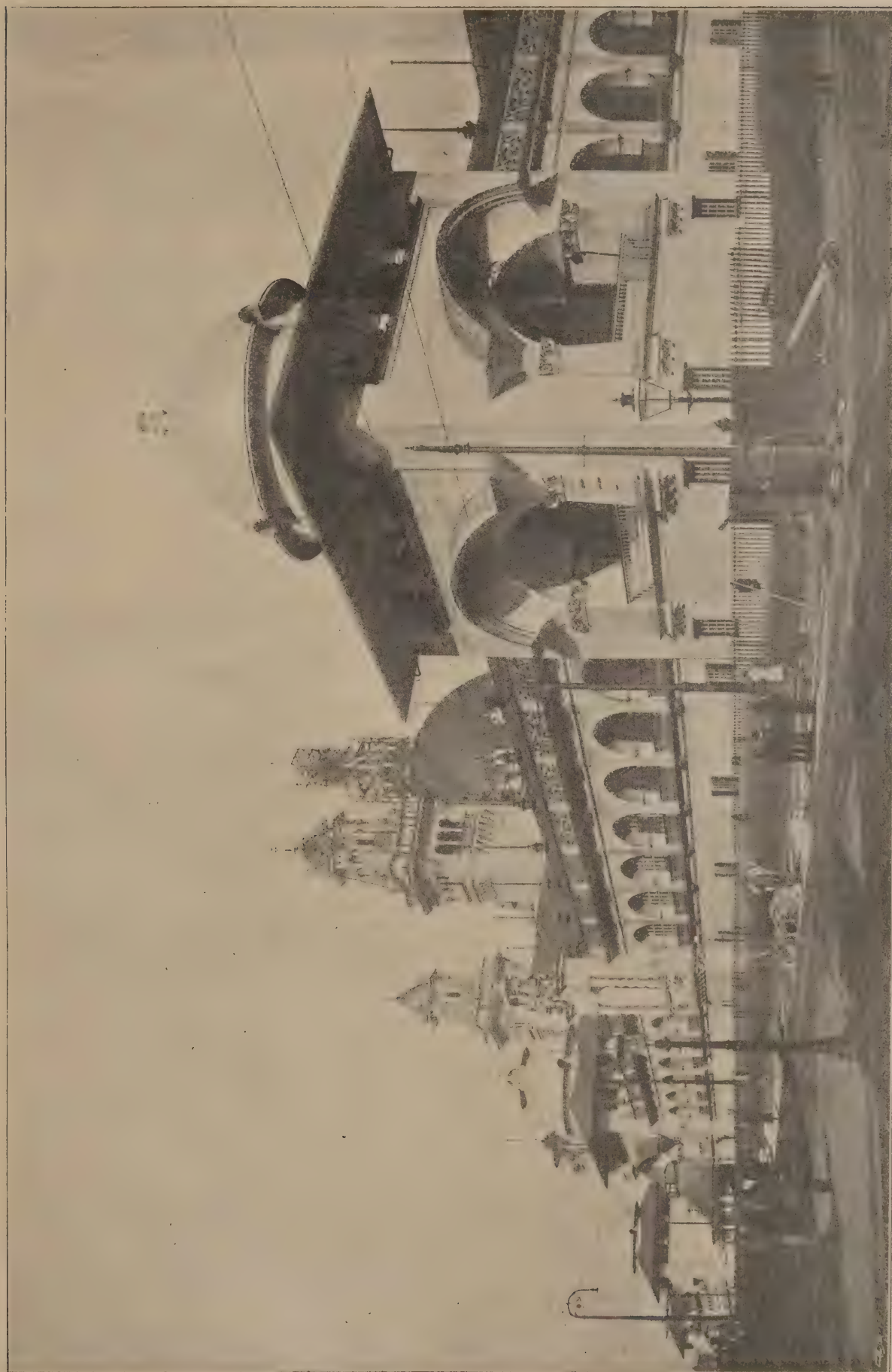
LONDON, W.—H. S. writes: "Kindly mention a book dealing with the Tower of the Winds at Athens."

Stuart and Revett's "Antiquities of Athens."

Young's Modulus.

MAC writes: "In the Board of Education syllabus for Building Construction—Advanced stage—it is stated that the student should know Young's Modulus. Where can I find information about this?"

Young's Modulus is variously called the modulus of longitudinal extensibility, the stretch modulus or the modulus of elasticity. The latter is the more usual name used by engineers and is the constant E used in formulæ. It is explained in Vol. IV. of Rivington's "Building Construction," Ewing's "Strength of Materials," and Rankine's "Manual of Civil Engineering."



GLASGOW INTERNATIONAL EXHIBITION, 1901: THE INDUSTRIAL HALL, JAMES MILLER, I.A., ARCHITECT.
COLOURING--WALLS, WHITE; ROOFS, RED; DOMES, GOLD; WOODWORK OF SHUTTERS, SASHES AND ASTRAGALS, BRIGHT GREEN.

Bricks and Mortar.

APHORISM FOR THE WEEK.

If a town is old, however poor, it is sure to have some beauty or interest; if new, we look for neither, but get out of it as soon as we can.—J. J. STEVENSON.

Our Plates.

THE works in connection with Colney Hall, Norwich, which are now nearly complete, consisted of the re-arrangement of the interior, together with the addition of a large wing at the north-west end which is not seen in the illustration, and a wing at the east end consisting of a conservatory with billiard-room behind and rooms over. The house was an uninteresting and somewhat poorly-built example of the class of work in vogue at the beginning of the last century and was stuccoed all over in imitation of stone and painted pink. The two bays shown on either side of the front door are new, as are the stone rusticated piers of the house and the stone cornice and balustrade. The house itself has been entirely refaced to match the new brick-work, and the new additions have been carried out in red brick and Bath stone, the bricks themselves being obtained from Cossey in Norfolk. Other works in connection with the property generally comprise alterations to the stables, a new engine-house and power-house for the electric light, and a boat-house on the river-bank. The whole has been carried out from the designs and under the superintendence of Mr. Arthur C. Blomfield by Messrs. J. Youngs & Son, of Norwich, the clerk of the works being Mr. F. Comport.

Modernizing Nuremberg.

WRITING in the "Morning Post" recently Mr. Francis Watt said:—Disillusion, appalling in its completeness! That is your first, nay your second, impression of Nuremberg. A monstrous railway station, clamorous and ugly as Clapham Junction. Outside, great, broad, fine streets, the exact pattern of those in every other prosperous German town; spick and span shops crammed with the latest fashion in everything; electric trams with overhead wires rushing at breakneck speed in all directions; dotted around are great chimney shafts doing so prosperous a business that the sky is heavy with their smoke. Such is "The quaint old town of toil and traffic, Quaint old town of art and song." What strikes you most is the frightful newness of everything. Not here, as in Bruges, do you get whole streets of mediæval houses. No; you must reconstruct your Nuremberg, as palæontologists do extinct animals, from stray fragments.

The Academy Prize.

THOUGH the present is an "off" year at the Royal Academy Schools a long list of prizes is offered to the students. The biennial medals and scholarships will not be offered again until 1903, but the prizes to be competed for in the present year include a large number of silver medals, as well as awards in money amounting altogether to about £450. The chief prize this year is that of £40 for design in water-colour or tempera for the decoration of a portion of a public building. If the design is of exceptional merit the student is afforded an opportunity of carrying it out at the expense of the Academy. A sum of £4 a week is allowed to the prize-winner while the work is in progress, and several large pieces of mural decoration have been carried out under these conditions in the refreshment-room at Burlington House and in the nurses' refectory at Guy's Hospital. The subject set for the present year is "Dawn." The subject for the cartoon of a draped figure is "A Sibyl," and the two prizes offered for design in architecture are "A Picture Gallery for a Country Town" and "A Formal Garden."

Tavistock Parish Church is proposed to be repaired from plans by Mr. G. H. Fellowes Prynn, F.R.I.B.A., at a cost of about £1,000. The whole of the floor, throughout the nave and aisles is more or less infected with dry rot. The floor is proposed to be renewed from end to end, and a system of ventilation arranged. The roof also requires attention. The carved bosses and external lead gutters will be attended to.

Keystones.

A New Fire Station at Greenwich has been built at the junction of Tunnel Avenue and Horn Lane with Lower Greenwich Road.

The Devon and Exeter Architectural Society held a meeting at Exeter on February 28th last, when a paper was read by Mr. A. S. Parker, A.R.I.B.A., of Plymouth.

Tenby Borough Surveyorship.—More than forty applications were received for this post, and among them was that of Mr. H. T. Morley, who resigned the position in 1895 after holding it for twenty-two years. This has aroused considerable local feeling.

"Structural Colour Decoration of the Interior of Public Buildings."—Owing to the great pressure on our space we are reluctantly obliged to hold over till next week the paper with this title which Mr. Gerald C. Horsley read before the Society of Arts on March 4th.

Mr. Edwin O. Sachs will on Thursday, March 13th, lecture before the Society for the Encouragement of the Fine Arts on "Artistic Electric Illuminations" having special reference to the impending Coronation. The lecture will be given at the Galleries of the Royal Society of British Artists, Suffolk Street, Pall Mall, at 8 p.m.

New Baths at Leeds.—The Leeds Corporation Baths Committee have accepted the prize design of Mr. J. Lane Fox, Leeds, for the baths proposed to be erected at Bramley, and he has been asked to prepare working plans in order that the work may be proceeded with as early as possible. The estimated cost of the buildings is £8,000.

Liverpool Queen Victoria Memorial.—The Committee have selected the design of Messrs. C. J. Allen, F. M. Simpson, W. E. Willink and P. C. Thicknesse. It consists of a statue of Her late Majesty, which is to be of heroic size and of bronze, to be placed on a pedestal, under an Ionic stone canopy. The dome will be supported by sixteen pillars, and after nightfall will be lit up by electricity. The total height of the memorial will be about 30ft.

The T-Square Club held a ladies' concert last Wednesday at Covent Garden Opera House. The band of the Coldstream Guards played numerous selections during the evening, and contributions were given to the programme by Miss Elsie Southgate, violinist; Miss Margaret Ormerod, soprano; and Miss Fanny Wentworth, the well-known drawing-room entertainer. Mr. Lemprier Pringle gave three excellent songs; Mr. Herbert Harvey a musical sketch; and Mr. J. O'Gorman told some amusing Irish stories. The honorary secretary of the club is now Mr. F. Coleridge Simpson, 99, St. Martin's Lane, W.C.

"Paris in London," this year's exhibition at Earl's Court, will be opened early in May by the Lord Mayor, Sir Joseph Dimsdale. Apart from the French Industrial Section, a French Fine Art Section has been organised. The familiar buildings and grounds at Earl's Court will this year undergo considerable transformation. The Queen's Court, with its elaborate Indian architecture, will give place to a representation of the most notable palaces of the great Paris Exhibition, while the part of the exhibition known as "Old London" will undergo complete transformation. On the site will arise a "Picturesque Paris," including a new structure resembling the Summer theatres in the Champs Elysées.

The Dry Rot Fungus was the subject of Mr. Summerville's recent lecture before the Architectural Section of the Royal Philosophical Society of Glasgow. He pointed out that dry rot was a disease of civilization, and was only found in and around dwellings and other buildings of man; it had never been found in the forest. The conditions favourable to the growth of the fungus were moisture and a warm, still atmosphere. As to its prevention and cure, the foundations of buildings should be so arranged that no water or moisture be allowed to accumulate near them, and buildings should be so ventilated as to keep the foundations and other parts of buildings dry. Wood for fittings should also be dried before being used, and sound-deadening materials should be thoroughly sterilised.

Mr. Arthur Marshall, A.R.I.B.A., of Nottingham, has been appointed by the Stourbridge Board of Guardians as architect to the new workhouse and cottage homes.

The Arthur Cates Prize is a new prize added to the R.I.B.A. list for this year (see p. 20 of our issue for February 26th); it is founded more especially in relation to the application of geometry to vaulting, stability of edifices, and design. The Godwin Bursary has been increased in value from £10 to £65.

Fulham's New Baths.—The members of the Institution of Junior Engineers paid a visit recently to the new baths and washhouses of the metropolitan borough of Fulham in Melmoth Place, Fulham Road. The architect, Mr. H. Dighton Pearson, A.R.I.B.A., showed the members over. Mr. Charles Wall, of Chelsea, is the builder, and his contract is for £42,953. The engineering, electric lighting, well-sinking and pumping machinery cost £15,000.

A New Nazareth Home at Lancaster has been erected at a cost of about £15,000 in Ashton Road for the Order of the Sisters of Nazareth, whose headquarters are at Hammersmith, London. Provision is made for 250 destitute children. The buildings are in the Tudor style, with mullioned and transomed windows. The following were the contractors:—Masons, B. Graham & Sons, Huddersfield; carpenter, T. Hird, of Keighley; joiners, Messrs. J. Hatch & Sons, of Lancaster; slaters, Messrs. Hill & Nelson, of Morecambe; plasterer, O. Lister Ilkley; plumbers and electric lighting, Messrs. Calvert & Heald, of Lancaster; heating, Messrs. Dilworth & Carr, of Preston; cooking appliances, Messrs. Newton, Chambers & Co., of Manchester; and laundry fittings, Messrs. Bradford & Co., Salford. Messrs. Austin & Paley, of Lancaster, were the architects.

New Patents.

These patents are open to opposition until April 12th.

1901.—Cleaners for Gulleys, Pipes, Traps, &c.—2,653. G. B. WILSON, Brierley, near Barnsley, Yorks. The cleaner consists of a dished scraper pivoted at the end of a rod and capable of being operated by the handle of a second rod which passes up through the main one.

Moistening Air in Factories, &c.—5,678. G. RICHTER, Mildenau, Bohemia, Austria. Air is forced through a nozzle in a water-tank, thus sucking up water through two small pipes attached to the nozzle and delivering it in very fine spray or mist.

The following specifications were published on Thursday last, and are open to opposition until April 19th. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1900.—20,219, SHONE & AULT, ventilating and flushing drains. 20,358, HART, ventilating with filtered, cooled or warmed, and moistened air.

1901.—3,382, HOLWILL, manufacture of tiles. 4,657, STEIGER, manufacture of cement. 4,912, MITCHELL, saw-set. 5,094, TREWBY & BIGGART, apparatus for clearing ascension pipes of gas retorts. 5,313, LEES, LEES & LEES, guides for band-sawing machines. 5,918, STEWART, gully traps. 6,312, DOULTON, water-supply valves for closets. 7,521, GARDNER (*Cady*), chains. 7,522, GARDNER, chains. 10,851, MOORE, windows. 13,890, CROSSE, wooden panels, linings, &c. 15,443, GHYS, door or window catch. 17,608, WATTS, valves. 19,648, HOUGHTON, firebricks for domestic grates. 20,864, PARRY, regulating air, heat and combustion in domestic grates. 23,277, KOPPERS, construction of coke ovens by means of a specially-shaped stone. 23,548, JØRGENSEN, window frames. 24,181, INGLIS, chimney pots. 25,113, VAN DUYL, protecting water pipes or conduits against frost. 26,109, JOHNSON, adjustable scaffolds for use upon chimney stacks. 26,153, JACOBS, tunnels.

1902.—438, WALL, locking taps. 475, THOMPSON (*Sosna & Sosna*), saws. 934, EICKHOFF, sink trap.

CURRENT MARKET PRICES.

FORAGE.			
	£ s. d.	£ s. d.	
Beans per qr.	1 10 0		
Clover, best per load	4 15 0	5 10 0	
Hay, best do.	5 5 0	5 12 6	
Sainfoin mixture do.	4 10 0	5 5 0	
Straw do.	1 8 0	2 0 0	
OILS AND PAINTS.			
Castor Oil, French .. per cwt.	1 7 0	1 8 7	
Colza Oil, English .. do.	1 7 9		
Copperas per ton	2 0 0		
Lard Oil per cwt.	2 9 6		
Lead, white, ground, carbonate do.	1 4 10		
Do. red do	1 0 4		
Linseed Oil, barrels .. do	1 11 0	1 11 3	
Petroleum, American .. per gal.	0 0 6	0 0 7	
Do. Russian do	0 0 6	0 0 6	
Pitch per barrel	0 7 0		
Shellac, orange per cwt.	5 15 0		
Soda, crystals per ton	3 2 6	3 5 0	
Tallow, Home Melt .. per cwt.	1 10 9	1 11 3	
Tar, Stockholm per barrel	1 3 6		
Turpentine per cwt.	1 10 10		
METALS.			
Copper, sheet, strong .. per ton	71 0 0		
Iron, Staffs, bar do.	6 15 0	8 10 0	
Do. Galvanised Corrugated sheet .. do.	11 12 6	11 15 0	
Lead, pig, Soft Foreign .. do.	11 11 3	11 13 9	
Do. do. English common brands .. do.	11 17 6	12 0 0	
Do. sheet, English 3lb per sq. ft. and upwards .. do.	13 0 0		
Do. pipe do.	13 0 0		
Nails, cut clasp, 3in. to 6in. per ton	9 0 0		
Do. floor brads do.	8 15 0		
Steel, Staffs, Girders and Angles do.	5 15 0	6 5 0	
Do. do. Mild bars do.	6 10 0	7 0 0	
Tin, Foreign do.	115 0 0	115 10 0	
Do. English ingots do.	117 10 0	118 0 0	
Zinc, sheets, Silesian .. do.	21 0 0		
Do. do. Vieille Montaigne .. do.	21 10 0		
Do. Spelter do.	17 13 9	18 5 0	
TIMBER.			
SOFT WOODS.			
Fir, Dantzic and Memel .. per load	2 1 0		
Pine, Quebec, Yellow .. per load	4 7 6	6 0 0	
Do. Pitch do.	2 9 0	3 0 0	
Laths, log, Dantzic .. per fath.	4 10 0	5 10 10	
Do. Petersburg .. per bundle	0 8		
Deals, Archangel 2nd & 1st per P. Std.	15 5 0	22 0 0	
Do. do. 4th & 3rd .. do.	10 15 0	12 10 0	
Do. do. unsorted .. do.	5 12 6	6 10 0	
Do. Riga do.	6 15 0	8 10 0	
Do. Petersburg 1st Yellow .. do.	9 0 0	15 0 0	
Do. do. 2nd .. do.	10 0 0	11 10 0	
Do. do. White .. do.	7 5 0	11 10 0	
Do. Swedish do.	11 5 0	15 10 0	
Do. White Sea do.	10 10 0	11 15 0	
Do. Quebec Pine, 1st .. do.	19 10 0	21 5 0	
Do. do. 2nd .. do.	9 0 0	18 10 0	
Do. do. 3rd & 4th .. do.	9 0 0		
Do. Canadian Spruce, 1st .. do.	7 10 0	9 5 0	
Do. do. 3rd & 2nd .. do.	7 5 0	9 0 0	
Do. New Brunswick .. do.	7 5 0	8 0	
Battens, all kinds .. do.	5 12 6	10 15 0	
HARD WOODS.			
Ash, Quebec per load	3 17 6	4 10 0	
Birch, Quebec do.	3 12 6	3 17 6	
Box, Turkey per ton	7 0 0	15 0 0	
Cedar, lin., Cuba per ft. sup.	0 0 4		
Do. Honduras do.	0 0 1		
Do. Tobasco do.	0 0 7		
Elm, Quebec per load	0 12 6	5 10 0	
Mahogany, Average Price			
for Cargo, Honduras .. per ft. sup.	0 0 4		
Do. African do.	0 0 3		
Do. St. Domingo .. do.	0 0 5		
Do. Tobasco do.	0 0 4		
Do. Cuba do.	0 0 4		
Oak, Dantzic and Memel .. per load	3 15 0	5 7 6	
Do. Quebec do.	4 12 6	5 0 0	
Teak, Rangoon, planks .. do.	6 0 0	17 10 0	
Wainscot, Riga (Baulk) .. do.	3 15 0	5 15 0	
Do. Odessa Crown .. do.	3 15 0	5 15 0	
Walnut, American .. per cub. ft.	0 3 1		

COMING EVENTS.

Wednesday, March 12.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.
 EDINBURGH ARCHITECTURAL ASSOCIATION.—Prof. G. Baldwin Brown on "Some Thoughts on the Dome as an Architectural Form," 8 p.m.
 NORTHERN ARCHITECTURAL ASSOCIATION.—Annual Meeting at 7.30 p.m.
 INSTITUTION OF CIVIL ENGINEERS.—Annual Dinner at the Merchant Taylors' Hall, Threadneedle Street, E.C., at 7 p.m.
 INSTITUTE OF SANITARY ENGINEERS.—Meeting of Examination and Literary Committee at 3.45 p.m., of General Purposes and Finance Committee at 4 p.m., Extraordinary General Meeting at 5 p.m., and Election Committee at 5.30 p.m., Sessional Meeting at 7 p.m.
 ARCHITECTS' BENEVOLENT SOCIETY.—Annual meeting in the R.I.B.A. rooms, at 5 p.m. Mr. William Emerson, president, in the chair

Thursday, March 13.

CARPENTERS' COMPANY, Carpenters' Hall, E.C.—Prof. T. Roger Smith, F.R.I.B.A., on "Exeter Cathedral," 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.
 INSTITUTION OF ELECTRICAL ENGINEERS.—Meeting at 8 p.m.
 LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Ernest Newton on "House Building," 6.30 p.m.
 SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Edwin O. Sachs on "Artistic Electric Illumination," 8 p.m.
 MANCHESTER SOCIETY OF ARCHITECTS.—Paper by Mr. Charles M. Hadfield.

Friday, March 14.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. H. C. Lander on "Co-operative Homes," 7.30 p.m.
 INSTITUTION OF JUNIOR ENGINEERS.—Mr. Percival Marshall on "The Uses of Engineering Models," 8 p.m.
 SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Paper by Mr. T. G. Jackson, R.A.
 PHYSICAL SOCIETY.—Meeting at 5 p.m.
 SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. R. Elsey Smith, A.R.I.B.A., on "Sanitary Building Construction and Planning: Soil and Local Physical Conditions," 7 p.m.
 ROYAL INSTITUTION.—Prof. Silvanus P. Thompson on "Magnetism in Transit," 9 p.m.
 INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. H. J. Deane, B.E., on "The Use of Long Steel Wires in Surveying," 8 p.m.

Saturday, March 15.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at the Sewage Works, Sutton, Surrey, at 3 p.m., conducted by Mr. C. Chamber Smith.
 ROYAL INSTITUTION.—Lord Rayleigh on "Some Electrical Developments"—V., 3 p.m.
 INSTITUTION OF JUNIOR ENGINEERS.—Conversation at the Westminster Palace Hotel at 7 p.m.

Monday, March 17.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. Sidney K. Greenslade on "The Planning of some recent Library Buildings in the United States," 8 p.m.
 SURVEYORS' INSTITUTION (Junior Meeting).—Mr. Donald Dinwiddie, F.S.I., on "Reports of Royal Commission on Local Taxation," 7 p.m.
 ROYAL PHILOSOPHICAL SOCIETY OF GLASGOW (Architectural Section).—Mr. A. G. Wallis, M.S.I., on "Some Details of Modern Sanitary Practice," 8 p.m.

Tuesday, March 18.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Ventilation, Warming and Lighting," 7 p.m.
 ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. James Miller on "The Building of the Glasgow Exhibition," 7.45 p.m.

Wednesday, March 19.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.
 SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration in the District of Islington, and at the Borough Disinfecting Station, at 2 p.m. Conducted by Mr. James R. Leggett. Mr. W. Spinks, A.M.I.C.E., on "Calculations, Measurements and Plans and Sections," at 7 p.m.

Thursday, March 20.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.
 CARPENTERS' COMPANY, Carpenters' Hall, E.C.—J. Alfred Gotch, F.S.A., F.R.I.B.A., on "Early Renaissance Buildings in England," 8 p.m.
 SOCIETY OF ARCHITECTS.—Mr. Walter C. Williams, Solicitor, on "The Desirability of an alteration in the law relating to Ancient Lights," 8 p.m.
 SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Sanitary Appliances," 7 p.m.

Friday, March 21.

ARCHITECTURAL ASSOCIATION.—Mr. W. H. Lever on "The Dwellings erected at Port Sunlight and Thornton Hough," 7.30 p.m.
 SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "House Drainage," 7 p.m.
 ROYAL INSTITUTION.—Geheimrath Prof. Otto N. Witt, Ph.D., F.O.S., on "Recent Developments in Colouring Matters," 9 p.m.

The Architectural Association of Ireland held a meeting on March 4th, Mr. R. M. Butler occupying the chair. Mr. Marmaduke Purcell, M.I.C.E.I., lectured on "Chemistry in its relation to the Arts."

The bricklayers' labourers at Vickerstown, Walney, last week demanded an increase of 3d. per hour, making their wages 7d. per hour. Some of the sub-contractors granted the increase, the men resuming work. Other masters, however, refused the terms, and their men have left work.

Mr. Richard Veevers, J.P., late of Preston and Fulwood, died recently at his residence, Oakhill, Windermere, at the age of eighty years. He was engaged as an architect up to ten years ago, when he retired, in the firm of Myres, Veevers & Myres, of Chapel Street, Preston. He was apprenticed to Mr. William Lamb, agent for the Duke of Hamilton at Hay Carr, to be taught "the art, mystery and profession" of a land surveyor. His time expired in May, 1842. In 1847 he entered into partnership with Mr. John James Myres, of Preston.

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
March 13	Luddendew-Foot, Todmorden—Boiler House, &c.	—	Sutcliffe & Sutcliffe, Architects, Todmorden.
" 13	Barnby, Beccles—School-room	—	R. S. Cockrill, Architect, Crossley House, Lowestoft.
" 13	Clones, Ireland—Alterations to Hospital	Guardians	R. Clark, Clerk, Workhouse, Clones.
" 13	Hopkinstown, Wales—Chapel	—	A. O. Evans, Architect, Pontypridd.
" 13	London, S.E.—Engineer's Cottage at Fever Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 13	London, S.W.—Visitors' Room at Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 13	Perth—Retort Bench, Chimney, &c.	Corporation	W. B. M'Lusk, Engineer, Friarston, Perth.
" 13	Tobercurry, Ireland—Creamery	—	J. Donohoe, Hon. Sec., Tobercurry.
" 13	London—Gate Porter's Lodge and Addition to House	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 13	Stratford-on-Avon—Infirmary for Women	Union Guardians	C. Smith & Son, 164 Friar Street, Reading.
" 13	Blackpool—Lime, Cement, Bricks, &c.	Highways Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 14	Pilton—Two Cottages	—	J. Thomas, Bailiff, Bullhill, Pilton.
" 14	Preston, Lancs—Bricks	Corporation	Borough Surveyor, Town Hall, Preston.
" 14	Aberayon, Wales—Chapel Renovation	Wesleyan Connexion	Rev. J. Lloyds, Greenland Terrace, Aberayon.
" 14	Preston—Alterations, &c., to Public House	—	Borough Surveyor, Town Hall, Preston.
" 14	London, N.W.—Foundations to Power Station	St. Pancras Borough Council	Electricity Department Offices, 57 Pratt Street, N.W.
" 16	Aberavon—Retort House, Coal Store, &c.	Corporation	T. Newbigging & Son, 5 Norfolk Street, Manchester.
" 16	Haslingden—Bricks, Ashlar Stone, Landings, Cement	Town Council	J. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 16	Newcastle-upon-Tyne—Alterations, &c., to Premises	School Board	C. S. Errington, Architect, Victoria Buildings, Grainger Street West, Newcastle.
" 15	Radcliffe, Lancs—Engine House, Boiler, House, &c.	Urban District Council	W. L. Rothwell, Engineer, Council Office, Radcliffe.
" 15	Belmullet, co. Mayo—Rectory	—	J. S. Cairns, Architect, Dillon Terrace, Ballina.
" 15	Balham, S.W.—Alterations, &c., to Branch Library	Wandsworth Borough Council	Surveyor, 215 Balham High Road, S.W.
" 15	Arnside, Westmorland—Bridge Works	Rural District Council	R. Dobson, Jasmine Cottage, Milnthorpe.
" 15	Blaengarw, Wales—Hotel	J. Price	P. J. Thomas, Architect, Bridgend.
" 15	Blairadam, Scotland—20 Workmen's Houses	Fife Coal Co., Ltd.	Company's Office, Cowdenbeath.
" 15	Llanymynech, Wales—Schoolroom	—	Rev. G. O. Evans, Gardd, Llanymynech.
" 15	Longtown, Cumberland—Cottage	—	No. 1, High Street, Longtown.
" 15	North Burton, near Bridlington—Chapel Restoration	Wesleyan Connexion	S. Dyer, Architect, Bridlington.
" 15	Swindon—Alterations, &c., to Premises	—	R. J. Beswick, 35 Regent Street, Swindon.
" 15	Swindon—Addition to Premises	W. W. Hunter	R. J. Beswick, 35 Regent Street, Swindon.
" 16	Preston—Out Patient Department at Infirmary	—	F. E. Dixon, 49 Lune Street, Preston.
" 16	Brentwood—Residence	—	A. T. G. Woods, Architect, New Road, Brentwood.
" 17	Bradford—Caretaker's House	School Board	Mr. Hargreaves, Exchange Buildings, Bradford.
" 17	Bradford—Pulling-down and re-erecting School	School Board	W. Bailey, Architect, Market Street, Bradford.
" 17	Wyke, Bradford—School	Bradford School Board	Adkin & Hill, Architects, Prudential Buildings, Bradford.
" 17	Aylesbury—Repairing Houses, &c.	—	F. Taylor, 26 Temple Street, Aylesbury.
" 17	Bury, Lancs—Alterations, &c., to Laboratory and Locomotive Shed	Gas Committee	H. Simmonds, Engineer, Gasworks Bury.
" 17	Ebbw Vale, Mon.—26 Cottages, Shop and Villa	J. F. Jones	B. J. Francis, Architect, Abergavenny.
" 17	Newmarket—Workhouse Extensions	Guardians	Holland & Sons, Architects, High Street, Newmarket.
" 17	Quainton, Aylesbury—Repairing School	—	F. Taylor, 26 Temple Street, Aylesbury.
" 17	Waunllwyd, Wales—Church	—	J. Phillips, Own Road, Waunllwyd.
" 17	Meadowfield, near Durham—Cottage	Waterworks Co.	Mr. Askwith, Co.'s Resident Engr., South Rd., Bishop Auckland.
" 17	Great Harwood—School	—	J. B. Thornley, Architect, Darwen.
" 17	London, S.E.—Bricks, Lime, &c.	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Bermondsey.
" 17	Knotty Ash, near Liverpool—Infirmary	Parish Vestry	E. Kirby & W. E. Willink, 5 Cook Street, Liverpool.
" 17	Newmarket—Workhouse Extensions	Guardians	Holland & Sons, Architects, High Street, Newmarket.
" 17	Aughton, near Sheffield—Hospital	—	J. D. Webster, 19 St. James Street, Sheffield.
" 17	Halifax—Model Bakery, Two Shops, Offices, &c.	G. Whitley & Son	J. F. Walsh & G. Nicholas, Architects, Museum Chambers, Halifax.
" 17	Widnere—Alterations to Grammar School	—	J. Pattinson, Architect, Widnere.
" 17	Carmarthen—Cattle Markets, &c.	Town Council	F. J. Finglah, Borough Surveyor, John Street, Carmarthen.
" 18	Hoddesdon, Herts—Repair of Lodge	Rural Joint Committee	P. R. Longmore, Clerk, High Street, Hoddesdon.
" 18	Ffynonwen, Wales—Farmhouse	—	D. T. Isaac, Wheat Street, Brecon.
" 18	Ramsbottom, Lancs—School	School Board	T. Bell, 14 Grimshaw Street, Burnley.
" 18	Aldershot—Gates	Urban District Council	N. F. Denis, 126 Victoria Road, Aldershot.
" 18	Kingston-upon-Hull—Junior Department at School	School Board	Botterill, Son & Bilson, 23 Parliament Street, Hull.
" 19	Llangwryfon—School and Master's Residence	Llangwryfon Urban District School Board	D. Jones, Architect, Ponthrydfendigaid.
" 19	Carlisle—Bricks, Tiles, Cement, &c.	—	H. O. Marks, 36 Fisher Street, Carlisle.
" 19	Padiham—Bricks, Cement, &c.	Urban District Council	J. Gregson, Engineer, Council Offices, Padiham.
" 19	Aldershot—Brickwork, &c., of two Sewage Filters	Urban District Council	Surveyor, Council Office, Victoria Road, Aldershot.
" 19	Barry, Wales—Hall	—	G. Thomas, Architect, Queen's Chambers, Queen Street, Cardiff.
" 20	London, S.E.—Disinfecting Chamber, Stabling, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Lambeth Town Hall, Kennington Green, S.E.
" 20	Chichester—Business Premises	—	Saunders & Saunders Architects, Arcade Chambers, Newark.
" 20	Shipley, Sussex—Alterations to School and Cottage	—	E. S. Arkle, Shipley Vicarage.
" 20	Wyke, Bradford—Additions to House	F. Hind	Fairbank & Wall, Architects, Craven Bank Chambers, Bradford.
" 21	Chelmsford—Extension of Premises	Star Co-operative Society	Charles & W. H. Pertwee, Architects, Bank Chambers, Chelmsford.
" 21	Sheffield—Salesshops and Premises	A. Davy & Sons, Ltd.	Gibbs & Flockton, 15 St. James's Road, Sheffield.
" 21	Norwich—School	School Board	C. J. Brown, Architect, Cathedral Offices, Norwich.
" 21	Hoylake, Cheshire—Tiles, Cement, &c.	Urban District Council	L. G. Dasher, Surveyor, District Council Offices, Hoylake.
" 22	Macclesfield—Foundations, &c., to Infirmary Annex	—	H. Beswick, County Architect, Newgate Street, Chester.
" 22	Sutton Coldfield—Bricks, Cement, Lime	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
" 22	Willenhall, Staffs—Portland Cement, Paving Bricks	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
" 22	Dartford—Pair of Semi-detached Cottages	Rural District Council	Tait & Hobbs, Architects, Lowfield Street, Dartford.
" 24	Epsom—Additions, Alterations, at Isolation Hospital	Urban District Council	E. R. Capon, Surveyor, Bromley Hurst, Church Street, Epsom.
" 25	Long Eaton—Engine-room, Boiler House, Chimney Shaft, &c.	Urban District Council	F. Worrall, Engineer, Council Offices, Long Eaton.
" 25	Poplar—Workmen's Dwellings	London County Council	Architect's Department, Housing Branch, 18 Pall Mall East, S.W.
" 26	London, N.—Wall	Metropolitan Asylums Board	A. & C. Harston, 15 Leadenhall Street, E.C.
" 26	Chartham Downs, near Canterbury—18 Cottages	Kent County Asylums Committee	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
" 27	London, E.—Casual Ward	Stepney Guardians	F. R. Smith, 6 Great College Street, Westminster.
" 29	Harfield English, near Romsey, Hants—Church	Lady Ashburton	F. Bath, Architect, Crown Chambers, Salisbury.
" 1	Great Harwood, Lancs—Slaughter-houses	Urban District Council	A. H. Dunkin, Surveyor, Town Hall, Great Harwood.
" 1	Isleworth—Additions to Schools	Union Guardians	W. Stephens, Clerk, Union Offices, Isleworth.
" 4	West Ham—Public Library	Borough Council	Town Clerk, Town Hall, West Ham, E.
" 8	York—Offices	North-Eastern Railway Co.	W. Bell, Company's Architect, York.
" 8	Denton, near Gravesend—Hospital Block	Corporation of London	City Surveyor, Guildhall, E.C.
No date.	Hereford—Municipal Buildings	Town Council	H. A. Owers, Architect, Twickenham, W.
ENGINEERING:			
Mar. 13	Annan, Dumfries—Waterworks	Town Council	J. Barbour, 53 Baeleuch Street, Dumfries.
" 13	Maldon, Essex—Lining Well	—	T. R. Swales, Borough Surveyor, Maldon.
" 14	London, N.W.—Overhead Travellers	St. Pancras Borough Council	Electricity Department Offices, 57 Pratt Street, N.W.
" 14	Danbury, Essex—Water Supply Works	Chelmsford Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
" 15	Arnside—Re-erecting Bridge	South Westmorland R.D.C.	A. Milne, Clerk, Council Office, Kendal.
" 15	Heckmondwike—Electrical Plant	Electric Lighting Committee	G. H. Carter, Engineer, Power Station, Heckmondwike.
" 15	Aberavon—Gasworks	Corporation	T. Newbigging & Son, 5 Norfolk Street, Manchester.
" 15	Bournemouth—Coal and Ash Conveyors, &c.	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
" 17	Great Baddow, near Chelmsford—Boring	Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
" 17	Basford, Notts—Waterworks	Rural District Council	S. Maylan, Surveyor, Public Offices, Basford.
" 17	Prestonpans, Scotland—Waterworks	Paddington County Council	J. D. Watson, County Clerk, Haddington.
" 18	Tynemouth—Gravitation Main	Corporation	J. Mansergh, 5 Victoria Street, Westminster.
" 18	Birkenhead—2 Ferry Steamers	Corporation	Ferries Manager, Woodside, Birkenhead.
" 18	Antrim—Waterworks	County Asylum Committee	J. Barton, Engineer, Exchange Buildings, Dundalk.
" 18	Aberavon—Conversion of Pier	Town Council	Borough Surveyor, Town Hall, Aberavon.
" 19	Leytonstone—Heater, &c., at Workhouse	Union Guardians	F. E. Hilleary, Clerk, Workhouse, Leytonstone, N.E.
" 19	Wallsend—Steel Hopper	Corporation	G. Hollings, Borough Surveyor, Wallsend.
" 19	Wallsend—Refuse Destructor, &c.	Council	G. Hollings, Borough Surveyor, Wallsend.
" 20	Maryport—2 Cranes	Harbour Commissioners	F. Kelly, Clerk, Harbour Office, Maryport.
" 20	Liege, Belgium—Railway	—	Government Provincial, Liege.
" 20	Maryport—Hopper Barge	Harbour Commissioners	F. Kelly, Clerk, Harbour Office, Maryport.
" 21	Nelson, Lancs—Cistern, &c.	Gas Committee	A. J. Hope, Engineer, Gasworks, Nelson.
" 22	Roscommon, Ireland—Waterworks	Rural District Council	T. T. O'Keefe, Clerk, Council Office, Roscommon.
" 24	Ilford—Electric Tramways	Urban District Council	W. C. C. Hawtayne, 9 Queen Street Place, E.C.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY	WORK TO BE EXECUTED	FOR WHOM	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL:			
Mar. 13	Blackpool—Stores	Highway Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 15	Haslingden—Castings, Tools, &c.	Town Council	J. S. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 15	Bradford—Rails, &c.	Corporation	J. H. Cox, City Engineer, Town Hall, Bradford.
" 15	Wrexham—Cast-iron Tank	Town Council	Borough Surveyor, Wrexham.
" 15	Eastbourne—Cast and Wrought-iron Goods, Tools, &c.	Town Council	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
" 17	Bury, Lancs—Steam Fittings, Bolts and Nuts	Gas Committee	H. Simmonds, Engineer, Gas Works, Bury.
" 17	Manchester—Steel Roof Trusses, Girders, &c.	Tramways Committee	J. M. McElroy, 55 Piccadilly, Manchester.
" 17	Erith, Kent—Cast-iron Pipes, Gully Grates, &c.	Urban District Council	O. H. Fry, Clerk, Council Offices, Erith.
" 17	Manchester—1 ramway Rails, &c.	Tramways Committee	J. M. McElroy, 55 Piccadilly, Manchester.
" 17	London, S.E.—Ironmongery, &c.	Bermundsey Borough Council	F. Ryall, Town Clerk, Town Hall, Bermundsey.
" 18	Antrim—Pipes, &c.	County Asylum Committee	J. Barton, Engineer, Exchange Buildings, Dundalk.
" 18	Belfast—Iron Castings, Iron and Steel, Tools, &c.	Works Committee	Superintendent of Works Office, Town Hall Street, Belfast.
" 18	Powis Park, N.—Road Bridge over New River	Southgate Urban District Council	C. G. Lawson, Surveyor, Council Offices, Palmers Green, N.
" 19	Padiham—Ironwork	Urban District Council	J. Gregson, Engineer, Council Offices, Padiham.
" 19	Carlisle—Sewer Ironwork, Iron and Steel, Nails, &c.	Corporation	H. C. Marks, 31 Fisher Street, Carlisle.
" 19	St. Helens, Lancs—Manhole Covers, &c.	Corporation	G. J. C. Broom, Borough Engineer, Town Hall, St. Helens.
" 22	Sutton Coldfield—Bar-iron, Iron Castings, &c.	Corporation	W. A. H. Clarry, Borough Engineer, Town Hall, Sutton Coldfield.
" 22	Willenhall, Staffs—Stores	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
" 22	Burnley—Ironwork	Highways and Sewerage Committee	G. H. Pickles, Borough Surveyor, Town Hall, Burnley.
" 22	Withington, Lancs—Manhole Covers, &c.	Urban District Council	A. H. Mountain, Engineer, Town Hall, West Disbury, Manchester.
" 25	Hastings—Stopcocks	Corporation	P. H. Palmer, Town Hall, Hastings.
" 26	Moss Side, Manchester—Manhole Covers and Gratings	Urban District Council	H. B. Longley, Engineer, Moss Side, Manchester.
" 31	Manchester—Bolts, Nuts, &c.	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
April 14	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
" 23	Calcutta—Stopcocks	Corporation	F. Gainsford, Secretary, Corporation Offices, Calcutta.
PAINTING AND PLUMBING:			
Mar. 13	Blackpool—Brushes, Oils, Paints, &c.	Highway Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 13	London, S.W.—Painting, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 15	Great Yarmouth—Painting	Port and Haven Commissioners	J. T. Waters, 2 Quay, Great Yarmouth.
" 15	Preston—Oils, Varnish, Paints, &c.	Corporation	Engineer, Ribble Navigation, Engineers' Office, Preston.
" 15	Eastbourne—Oils, Colours, &c.	Town Council	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
" 15	Barnstaple—Colouring and Decorating Market	Urban District Council	Borough Surveyor, Municipal Buildings, Barnstaple.
" 15	Barnstaple—Painting and Repairs to Premises	Urban District Council	Borough Surveyor, Municipal Buildings, Barnstaple.
" 17	Bury, Lancs—Oils, White and Red Lead, Lead Tubing	Gas Committee	H. Simmonds, Engineer, Gas Works, Bury.
" 17	London, S.E.—Paints, Oils, &c.	Bermundsey Borough Council	F. Ryall, Town Clerk, Town Hall, Bermundsey.
" 17	Hanwell, W.—Road Works	Urban District Council	S. W. Barnes, Surveyor, Council Offices, Church Rd., W., Hanwell, W.
" 18	Belfast—Plumbers' Work, Paints and Oils	Works Committee	Superintendent of Works Office, Town Hall Street, Belfast.
" 19	Carlisle—Brushes, Paints, Oils, Varnishes, &c.	Corporation	H. C. Marks, 31 Fisher Street, Carlisle.
" 26	Larry, Glamorgan—Lead & Compo Pipe, Sheet Lead	Gas and Water Committee	F. M. Harris, Engineer Offices, Barry.
ROADS AND CARTAGE:			
Mar. 13	Blackpool—Stores and Materials	Highway Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 13	Clare, Suffolk—Granite	Rural District Council	W. H. Carr, Surveyor, Clare.
" 13	London, S.W.—Tar Paving	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 13	Barnard Castle—Materials	Rural District Council	W. Parkin, Surveyor, Barnard Castle.
" 13	London, S.W.—Kerbing and Spur Stones	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 13	London, S.E.—Roads	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Camberwell.
" 14	Guildford—Materials and Cartage	Rural District Council	W. S. W. Oullerne, Clerk, Commercial Road, Guildford.
" 14	Wrexham—Materials	Town Council	T. Bury, Town Clerk, Guildhall, Wrexham.
" 15	Burnley—Materials and Stores	Rural District Council	S. Edmondson, 18 Nicholas Street, Burnley.
" 15	Haslingden—Materials and Stores	Town Council	J. S. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 15	Eastbourne—Stores and Materials	Town Council	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
" 15	Stafford—Granite, Slag and Chippings	Rural District Council	W. Morgan, 4 Martin Street, Stafford.
" 17	Riccall, Selby—Materials	Rural District Council	E. Townend, 1 Abbey Place, Selby.
" 17	Heale—Materials	Sculcoats Rural District Council	A. Greaves, Surveyor, Heale.
" 17	Erith, Kent—Materials	Urban District Council	O. H. Fry, Clerk, Council Offices, Erith.
" 17	Sevenoaks—Street Works	Urban District Council	J. Mann, Surveyor, Council Offices, Sevenoaks.
" 17	Tutbury, Burton-on-Trent—Materials	Rural District Council	H. S. Tebbitt, 320 Shobnall Street, Burton-on-Trent.
" 17	London, S.E.—Materials	Bermundsey Borough Council	F. Ryall, Town Clerk, Town Hall, Bermundsey.
" 17	Hanwell, W.—Road Works	Urban District Council	S. W. Barnes, Surveyor, Council Offices, Church Rd. W., Hanwell, W.
" 18	Hertford—Road Works	Corporation	J. H. Jevons, Borough Surveyor, Hertford.
" 18	Tynemouth—Footpaths	Corporation	J. F. Smillie, Borough Surveyor, Tynemouth.
" 18	London, N.—Road Works	Hornsey Urban District Council	E. J. Lovegrove, Council's Engineer, Southwood Lane, Highgate, N.
" 18	Rushden, Northants—Granite and Slag	Urban District Council	W. B. Madin, Engineer, Vestry Hall, Rushden.
" 18	Tottenham—Making-up Roads	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
" 18	London, N.—Roads	Hornsey Urban District Council	E. J. Lovegrove, Council Offices, Southwood Lane, Highgate, N.
" 19	London, S.W.—Making-up and Paving	Fulham Borough Council	F. Wood, Borough Surveyor, Town Hall, Walham Green, S.W.
" 19	Maidenhead—Materials	Town Council	P. Johns, Surveyor, Guildhall, Maidenhead.
" 19	Uckfield, Sussex—Materials	Rural District Council	Mr. Miles, 173 High Street, Lewes.
" 19	Carlisle—Materials and Stores	Corporation	H. C. Marks, 31 Fisher Street, Carlisle.
" 19	Hazel Grove, Stockport—Materials	Urban District Council	G. S. Doncaster, Surveyor, Station Street, Hazel Grove.
" 19	Padiham—Materials	Urban District Council	J. Gregson, Surveyor, Council Offices, Padiham.
" 19	St. Helen's, Lancs—Materials and Stores	Corporation	G. J. C. Broom, Borough Engineer, Town Hall, St. Helen's.
" 20	Rothwell, near Leeds—Materials	Urban District Council	J. T. Pears, Surveyor, Council Offices, Rothwell, near Leeds.
" 21	Hoylake, Cheshire—Materials and Stores	Urban District Council	L. G. Dasher, Surveyor, Council Offices, Hoylake.
" 21	East Ham—Stores and Materials	Urban District Council	O. E. Wilson, Clerk, Public Offices, East Ham.
" 22	Willenhall, Staffs—Stores and Materials	Urban District Council	T. E. Fellows, Surveyor, Town Hall, Willenhall.
" 22	Burnley—Materials	Highways and Sewerage Committee	G. H. Pickles, Borough Surveyor, Town Hall, Burnley.
" 22	Durham—Paving Material	Corporation	City Surveyor, Durham.
" 22	Withington, Lancs—Materials	Urban District Council	A. H. Mountain, Surveyor, Town Hall, West Disbury.
" 22	Sutton Coldfield—Materials	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
" 24	Maidstone—Road Repair and Main Drainage	Kent County Council	F. W. Rack, 86 Week Street, Maidstone.
" 25	Blackwell, near Mansfield—Making up	Rural District Council	H. Silcock, 348 West Gate, Mansfield.
" 25	Ely, Cambs—Granite and Gravel	Rural District Council	E. B. Claxton, Clerk, Ely.
" 26	Moss Side, Manchester—Materials, &c.	Urban District Council	H. B. Longley, Surveyor, Moss Side, Manchester.
" 26	Stroud, Kent—Works and Materials	Rural District Council	G. W. Prall, Clerk, Workhouse, Stroud.
" 27	Canterbury—Materials	Roads and Survey Committee	A. C. Turley, City Surveyor, Guildhall Street, Canterbury.
" 29	Great Harwood, Lancs—Materials and Team Labour	Urban District Council	A. H. Dunkin, Surveyor, Town Hall, Great Harwood.
" 31	New Malden—Materials	Urban District Council	T. V. H. Davison, District Council Offices, Cambridge Road, New Malden.
April 1	Dartford—Street Works	Urban District Council	W. Haston, 8 Hythe Street, Dartford.
SANITARY:			
Mar. 13	Blackpool—Earthenware Pipes, &c.	Highway Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 13	Greenock—Sewage Purification Works	Town Council	J. Murray, Engineer, County Buildings, Paisley.
" 14	Wrexham—Drain Pipes	Town Council	Borough Surveyor, Guildhall, Wrexham.
" 15	Eastbourne—Pipes, Junctions, &c.	Rural District Council	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
" 15	Burnley—Earthenware Pipes, Disinfectants, &c.	Town Council	S. Edmondson, 18 Nicholas Street, Burnley.
" 15	Haslingden—Sanitary Pipe, Scavenging, &c.	Town Council	J. S. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 17	Eccles, Lancs—Disinfectants, &c.	Council	O. W. Laskey, Town Hall, Eccles.
" 17	Kirkstall, near Huddersfield—Drainage Works	Urban District Council	C. H. Marriott, Son & Shaw, Church Street Chambers, Didsbury.
" 17	Erith, Kent—Drain Pipes, &c.	Urban District Council	O. H. Fry, Clerk, Council Offices, Erith.
" 17	London, N.—Stoneware Pipe Sewer	Hornsey Urban District Council	E. J. Lovegrove, Council Offices, Southwood Lane, Highgate, N.
" 18	Southgate—Sewers	Urban District Council	C. G. Lawson, Surveyor, Council Offices, Palmers Green, N.
" 18	Belfast—Sewer Pipes, &c.	Works Committee	Superintendent of Works Office, Town Hall Street, Belfast.
" 19	Maidenhead—Stoneware Pipes	Town Council	P. Johns, Borough Surveyor, Guildhall, Maidenhead.
" 19	Baby-with-Hexthorpe, Yorks—Scavenging	Urban District Council	G. Gledhill, Council Offices, High Road, Baby.
" 19	Carlisle—Sewer and Drain Pipes, &c.	Corporation	H. C. Marks, 31 Fisher Street, Carlisle.
" 19	Padiham—Earthenware Pipes	Urban District Council	J. Gregson, Surveyor, Council Offices, Padiham.
" 19	Hazel Grove, Stockport—Sanitary Pipes, &c.	Urban District Council	G. S. Doncaster, Surveyor, Station Street, Hazel Grove.
" 19	St. Helen's, Lancs—Sewer & Drain Pipes, Disinfectants	Corporation	G. J. C. Broom, Borough Engineer, Town Hall, St. Helen's.
" 20	London, S.E.—Sanitary Work, &c.	Southwark Union Guardians	G. D. Stevenson, 13 & 14 King Street, E.C.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
SANITARY—continued.			
Mar. 20	Ardingley, Sussex—Sewer	Cuckfield Rural District Council	Mr. Beach, Surveyor, Munster Green, Hayward's Heath.
" 21	East Ham—Stoneware Pipes, Gully Fittings, Line	Urban District Council	E. E. Wilson, Clerk, Public Offices, East Ham.
" 21	Hoylelake, Cheshire—Drain Pipes, Disinfectants, &c.	Urban District Council	L. G. Dashper, Surveyor, District Council Offices, Hoylelake.
" 22	Sutton Coldfield—Earthenware Pipes, &c.	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall Sutton Coldfield.
" 22	Withington, Lancs.—Sewerage Pipes, Junctions, &c.	Urban District Council	A. H. Mountain, Surveyor, Town Hall, West Didsbury, Manchester.
" 22	Burnley—Earthenware Pipes, &c.	Highways and Sewage Committee	G. H. Pickles, Borough Surveyor, Town Hall, Burnley.
" 22	Willenhall, Staffs.—Stoneware Pipes, &c.	Urban District Council	T. E. Fellows, Surveyor, Town Hall, Willenhall.
" 24	Tewkesbury—Sewers, &c.	Rural District Council	H. A. Badham, Clerk, Tewkesbury.
" 27	Canterbury—Stoneware Sewer Pipes, &c.	Roads and Survey Committee	A. C. Turley, City Surveyor, Guildhall Street, Canterbury.
TIMBER:			
Mar. 15	Haslingden—Timber	Town Council	J. S. Green, Borough Surveyor, Municipal Offices, Haslingden.
" 15	Preston—Timber	Corporation	Engineer, Ribble Navigation, Engineer's Office, Preston.
" 15	Eastbourne—Timber	Town Council	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
" 17	London, S.E.—Timber, Hardwood Paving Blocks	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Bermondsey.
" 18	Belfast—Timber	Works Committee	Superintendent of Works Office, Town Hall Street, Belfast.
" 19	Carlisle—Timber	Corporation	H. O. Marks, 36 Fisher Street, Carlisle.

COMPETITIONS OPEN.

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Mar. 11	Dunstable—Infectious Diseases Hospital	£5 5s.	C. C. S. Benning, Town Clerk, Dunstable.
" 15	London, S.W.—Military Ambulance Wagons	£300, £250.	Director-General of Ordnance (O. 7), War Office, Pall Mall, S.W.
" 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Edge, Sheffield.
" 29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
" 31	Wakefield—Improvement of Interior of Exchange Buildings	£25, £10.	J. J. Martin, Bull Hotel, Wakefield.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
" 8	Oldham—Market Hall and Shops	£50, £30, £20.	S. A. Pickering, Borough Surveyor, Oldham.
" 21	Coleraine—Twenty-five Workmen's Dwellings	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
" 30	Glasgow—Branch Library (Local Architects)	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

New Companies.

Palmer's Decoration and Furnishing Co., Ltd.

Registered to acquire the business now carried on at 49 and 50, Sussex Place, South Kensington, Middlesex, by Palmer & Co.; to develop and extend the same, and generally to carry on business in the United Kingdom or elsewhere as manufacturers of and dealers in furniture, builders, house furnishers, gas and electric light fitters, &c. Capital 1,500 in £1 shares.

Sutcliffe, Speakman & Co., Ltd.

Registered to carry on business as manufacturers of brick, tile, cement and other machinery, appliances and tools, steam engines, clay working and hydraulic machinery, concrete and artificial stone, grinding and crushing machinery, &c. Capital £25,000 in £1 shares.

Vegox, Ltd.

Registered to carry on the business of colliery owners, landowners, fire-clay manufacturers,

quarry owners, brick and stone merchants, &c. Capital £1,000 in £1 shares.

Henry Joules, Ltd.

Registered to acquire the business of an ironmonger and house furnisher as formerly carried on at 64, 66, 81 and 83, Wellington Road, South Stockport, Chester, by the late Henry Joules; also as sanitary engineers, gas-fitters, builders, shop-fitters, &c. Capital £5,000 in £1 shares. Registered office: 64, Wellington Road, South Stockport.

Riviera Real Estate Co., Ltd.

Registered to acquire and turn to account any mines, mining rights and other property in the Republic of France or any other part of the world. Capital £20,000 in £4 shares.

West Hartlepool Patent Brick Co., Ltd.

Registered to carry on at West Hartlepool or elsewhere the business of brick, tile and pipe makers, potters, terra-cotta manufacturers, &c., and to acquire about sixteen acres of freehold

land at Longhill, Seaton Carew, West Hartlepool, together with the new brick-works and other property and rights held in connection therewith. Capital £37,000 in £1 shares. The first directors are J. Burn, H. Barnes, J. K. M. Hessler and J. Howe. Registered office: Windermere Road, West Hartlepool.

Blaxter Quarries, Ltd.

Registered to acquire and carry on the business of a quarry proprietor, now carried on by J. Watson, of Whitburn Terrace, Marsden, South Shields, at the Blaxter Quarry, Elsdon, Northumberland, as the Blaxter Quarry Co. Capital £4,000 in £10 shares. Registered office: 11 John Street, Sunderland.

Friary Works, Ltd.

Registered to acquire as a going concern the business of a bellhanger and founder carried on by Thomas Blackburn at the Friary Lane Works, Salisbury. Capital £1,000 in £1 shares. The directors are T. Blackburn, F. Rigden and H. K. Fulton.

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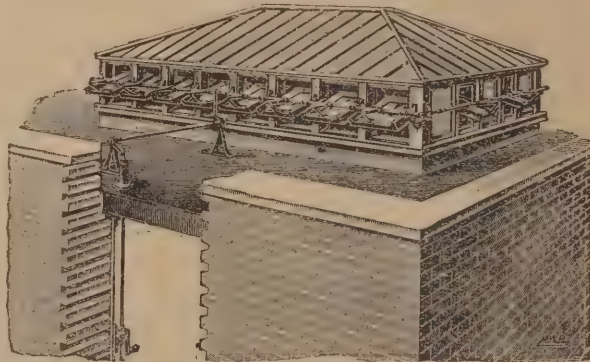
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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BLAENLLYNVI (MAESTEG, WALES).—For the erection of girls' school, classrooms, outbuildings, &c., to be built at Blaenllynu, Maesteg, for the Maesteg School Board. Messrs. E. W. Burnett & Son, architects, Tondur, near Bridgend:—
I. Rees, Maesteg ... £3,005 10
C. H. Cooksey, Miskin, Llantrisant ... 3,040 0
J. Jenkins, Caerau, Maesteg ... 2,895 0
* Accepted.

BOURNEMOUTH.—For works, &c., in connection with the Bournemouth Corporation tramways. Messrs. F. W. Lacey, M.I.C.E., borough and tramway engineer, and Lacey, Cliffrugh, and Sillar, consulting engineers, 2 Queen Anne's Gate, S.W.:—

Contract No. 12.—Overhead equipment.
G. Hill & Co. ... £22,601 1 0
Lowdon Bros. & Co. ... 21,410 16 4
British Insulated Wire Company ... 19,263 11 9
Macarthy, McElroy, & Co., Ltd. ... 19,734 10 0
J. G. White & Co., Ltd.* ... 18,933 3 0
J. G. White & Co., Ltd.* ... 19,533 3 0

British Thomson-Houston Company, Ltd.†
Contract No. 13.—Cables, &c.—With stoneware ducts.
J. G. White & Co., Ltd. ... 26,878 0 0
J. G. White & Co., Ltd.* ... 22,688 0 0
Siemens Bros. & Co., Ltd. ... 21,055 3 1
W. T. Glover & Co., Ltd. ... 24,006 0 0
St. Helen's Cable Company, Ltd. ... 23,575 10 6
W. F. Dennis & Co. ... 22,914 0 0
Western Electric Company. ... 22,885 6 9
British Insulated Wire Company, Ltd. ... 22,308 2 1
British Insulated Wire Company, Ltd.† ... 21,835 9 3
W. T. Henley's Telegraph Works Company, Ltd. ... 22,274 15 5
Callender's Cable and Construction Company, Ltd.* ... 20,669 13 5
Johnson & Phillips† ...

With Howard conduits.
Siemens Bros. & Co., Ltd. ... 27,558 11 8
W. T. Glover & Co., Ltd. ... 25,551 0 0
St. Helen's Cable Company, Ltd. ... 25,302 0 1
W. F. Dennis & Co. ... 25,305 4 9
Western Electric Company ... 25,602 10 3
British Insulated Wire Company, Ltd. ... 25,307 2 10
W. T. Henley's Telegraph Works Company, Ltd. ... 24,871 14 11
Callender's Cable and Construction Company, Ltd.* ... 24,500 10 10
Johnson & Phillips† ...
* Accepted. † Alternative. ‡ Informal.

CLACTON-ON-SEA.—For the erection of Boys' Holiday Home and Cottage in St. Osyth Road, Clacton-on-Sea, Essex. Mr. T. A. Cressy, architect and surveyor, Clacton-on-Sea:—
H. Smith ... £1,250 12 0
Ellis & Turner ... 1,250 0 0
J. McKay ... 1,210 0 0
Bray & Payne ... 1,198 10 0
Pennick & Taylor ... 1,188 0 0
W. S. Moore* ... 1,170 10 0
* Accepted. [All of Clacton-on-Sea.]

COVENTRY.—For the works required to be executed and materials supplied in erection of five new cottages and other buildings at the sewage pumping station, Whitely, for the Corporation:—
Barton & Cressie, Stoke, Coventry ... £1,850
A. A. Wincott, Foleshill Road, Coventry ... 1,651
Kelley & Son, Foleshill, Coventry ... 1,647
McCarthy & Co., Ellys Road, Coventry ... 1,530
Hallam & Co., New Street, Coventry ... 1,573
* Accepted.

EASTBOURNE.—For the erection of a Technical Institute and Fire Station for the Corporation:—

	In Portland stonework. Tech. Fire Inst. Station.	In Bath stonework. Tech. Fire Inst. Station.
Maple & Co. ...	35,436 5,115	33,053 4,993
Strange & Son ...	37,112 5,868	34,153 5,122
Holliday & Greenwood ...	35,777 5,085	34,769 4,979
W. & E. Noakes ...	38,158 5,440	36,709 5,317
Mark Hookham ...	40,328 6,540	38,802 6,435
J. S. Kimberley ...	42,353 6,267	40,180 6,060
Harris & Rowe, Ltd. ...	34,900 4,900	33,900 4,400
Gann & Co. ...	35,100 5,120	32,550 4,900
Goddard & Son ...	36,770 5,000	32,090 5,287
F. G. Minter ...	34,730 5,090	32,080 4,940
C. Jackson ...	36,596 5,333	35,306 5,780
W. J. Bloxham ...	37,011 5,303	36,424 5,160
Martin Wells & Co. ...	35,939 5,413	34,890 5,375
J. E. Johnson & Son ...	36,936 5,438	36,618 5,335
Louley & Co. ...	37,439 5,429	35,980 5,305

HARLESDOWN AND ST. NICHOLAS (NEAR CANTERBURY).—For the construction of sewers, outfall works, and pumping station for draining the parishes of Harbledown and St. Nicholas, near Canterbury, for the Bridge District Council. Mr. A. Bromley, engineer, Cathedral Precincts, Canterbury:—

Parmer & Sons, Margate ...	£5,190
Wallis & Sons, Maidstone, and at Folkestone ...	4,437
A. S. Ingleton, Herne Bay ...	4,149
T. Denne, Walmer ...	4,100
Cooke & Co., London ...	4,066
Low, New Broad Street ...	4,043
Killingback & Co., Camden Town, N.W. ...	4,037
W. Wilson, Avenue Road, Ramsgate ...	3,973
W. J. Adecock, Castle Street, Canterbury, and at Dover ...	3,551

* Accepted.

KIRTLINGTON (OXON).—For certain alterations and additions to the Park Farmhouse, Kirtlington, Oxon. Mr. Charles M. C. Armstrong, architect, 5 High Street, Warwick:—

W. J. Bloxham, Banbury ...	£388 0 0
G. Wyatt & Son, Oxford ...	380 0 0
T. Grimley & Son, Bicester ...	369 18 6

* Accepted.

LONDON, N.E.—For building casual wards, clothes store, laundry, and other buildings at Gainsborough Road, Hackney Wick, in the county of London, for the Guardians of Hackney Union:—

	£35,000	s. d.†
A. Monk ...	32,040	5 0
Todd & Newman ...	31,513	3 0
Kirk & Randall ...	30,950	—
J. Applebys ...	30,400	4 6
W. H. D. Kelland ...	29,575	3 0
McCormick & Sons ...	29,300	—
Coulson & Lofis ...	28,881	4 9
Thomas & Edge ...	25,500	—
W. Lawrence & Son ...	25,500	5 0
B. E. Nightingale ...	24,419	3 6
W. J. Clark ...	25,300	8 6
H. Lovatt ...	25,000	5 0
J. Chessum & Sons ...	27,825	1 0
Wilson Bros. & Lamplough ...	27,828	3 0
Kilby & Gayford ...	27,405	4 0
Perry & Co. ...	27,243	4 6
Shewin Bros. & Co. ...	26,085	5 0
C. G. Hill ...	26,946	5 0
W. Shurmer & Sons, Ltd. ...	24,983	3 0
C. Dearing & Son ...	24,100	4 0
Herbert Bros., Corporation Street, West Ham, E. ...	—	—

* Accepted. † Allowance per yard cube for sand.
OXFORD.—Accepted for the erection and completion of a detached house at the corner of Binsey Lane and Botley Road for Mr. John Lucas. Mr. Herbert Quinton, architect and surveyor, 22, George Street, Oxford.
Messrs. Kingirlee & Sons, Oxford ... £1,130

NANTYFYLON (MAESTEG, WALES).—For the erection of additional classrooms, outbuildings, &c., to the Nantyllyn. Infants' School, Maesteg, for the Maesteg School Board. Messrs. E. W. Burnett & Son, architects, Tondur, near Bridgend:—
F. O. Lewis & Son, Bridgend Road, Maesteg ... £1,450 0
I. Rees, Maesteg ... 1,347 8
H. Cooksey, Miskin, Llantrisant ... 1,330 0
H. Evans, Tywith, Maesteg ... 1,263 10
S. Lewis, Maesteg ... 1,060 0
* Accepted.

PUTNEY.—For the erection of four shops in Upper Richmond Road, Putney, for Mr. Thos. McIsaac. Mr. J. C. Radford, architect and surveyor, 103 Upper Richmond Road, Putney:—
W. J. Renshaw ... £3,991 10
H. Roffey ... 5,772
Adamson & Sons ... 5,725
J. Knight ... 5,475

SALFORD.—For the erection of a fire station, The Crescent, for the Corporation. Mr. Henry Kirkley, architect, 134 Deansgate, Manchester. Quantities by Mr. C. Bagot, 134, Deansgate, Manchester:—

Gerrard & Sons, Ltd. ...	£23,500
Peters & Sons ...	£21,888
J. Byron ...	23,341
W. Healey ...	21,841
Hill & Hey ...	22,650
Brown & Son ...	21,790
Southern & Sons ...	22,698
Burgess & Galt ...	21,500
J. Ramsbottom ...	22,578
Bullivant & Sons, Manchester ...	22,500
Daniels & Sons ...	22,500

* Accepted subject to confirmation by Council.

[Architect's approximate cost, £23,335.]

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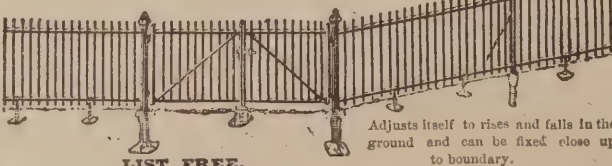
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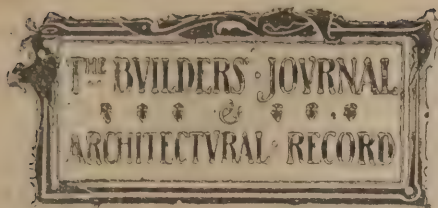
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Theatre
Architecture.

THE announcement that Mr. William Archer and Mr. Edwin O. Sachs are collaborating to produce a Blue Book on national, municipal or otherwise endowed theatres makes one think of the possibilities of theatre architecture and of those gaudy representations and finicking decorations which are so characteristic of the modern theatre architect. When any complaint is made the architect excuses himself on the score that he is only supplying what the proprietor demands, and the latter—should he not approve the scheme, which, however, he generally does—puts forward the plea that he is only satisfying the public taste; the result of all of which is that our theatre architecture is very insipid. That a fine effect is obtainable without barbarous and crude decoration can be seen at Mrs. Langtry's new theatre (to cite a recent example and one, be it noted, admired by the public); yet the majority of playhouses, and particularly the music-halls, are utterly vulgar in treatment. It is true that a building devoted to such purposes can legitimately claim a greater freedom in its decoration, but even madness has its method; and there is no necessity to gild and plaster with tawdry ornament every nook and crook till the eye tires of the disorder.

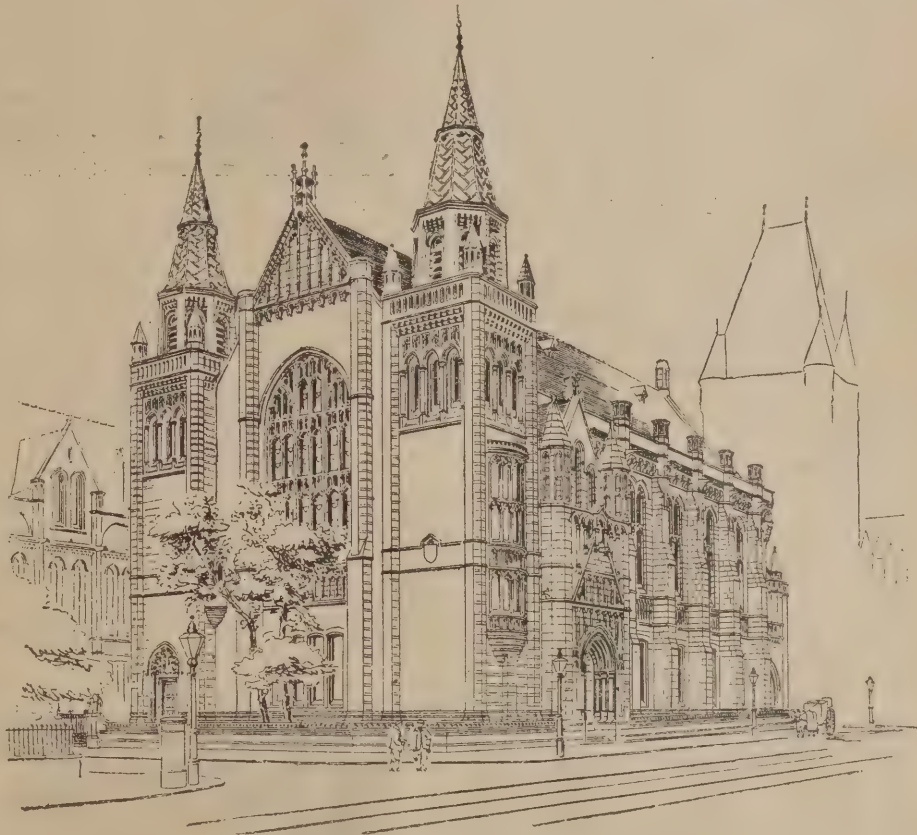
The new Whitworth Hall which has been added to Owens College, Manchester, was opened last week by the Prince and Princess of Wales. "The absence through illness of the architect," said the Prince, "is a matter of regret to all of us." The Hall proper is 65ft. high and occupies the upper storey, the ground floor comprising a number of rooms about 18ft. by 17ft. intended for various purposes—chiefly for examinations. The oaken roof of the hall, which is of modified "hammer-beam" construction, is particularly rich. The principals rest upon granite columns between which are the windows, the hall being lighted on both sides. The side windows, like the great window at the south end, are filled with coloured glass. The two south towers, in order that they should not vie unpleasantly with the tall tower—so

familiar a feature of the college—have been kept down to 100ft. from the pavement. The stone used—Minera stone—is the same as that employed in the rest of the college buildings. Mr. Paul Waterhouse has been mainly instrumental in carrying out his father's design.

American Brick-
laying Methods.

OUR latest lesson from the Americans is in the art of laying bricks quickly—1,800 and more per man per day, not the usual 400 odd of the average bricklayer or the 330 of the London County Council. Mr. Stewart, the building manager of the Westinghouse Company, tells how this is being done at the new engineering works in course of erection at Manchester: and, moreover, he takes pains to make it clear (see p. 67) that the bricks are being laid by British workmen belonging to the trade-union. And wherein lies the secret of this success? Good wages, intelligent supervision and modern labour-saving appliances are mainly responsible. Though the benefits of such methods have been

proposed shall (if desired) govern the conduct of future competitions. Most important among these is the proposal to appoint two assessors in every case involving special experience or where the cost exceeds about 20,000/., one assessor to judge the merit of the designs as architecture and the other to employ his special knowledge of the requirements for baths, hospitals, halls, &c.; while a third assessor is suggested as umpire if needed. It is further proposed that the Institute shall fix a scale of fees proportionate to the work done by the assessors, the payments to be made to the Institute, who would reward the assessors according to scale. There can be no doubt that assessors are often appointed who, though they be excellent architects in general, have no special knowledge of the work they are set to adjudge; the planning of hospitals, for instance, cannot properly be judged by a man who has never undertaken such work; and, *vice versa*, an architect may be thoroughly conversant with planning and yet be a bad judge of architecture; so that in many cases



WHITWORTH HALL, OWENS COLLEGE MANCHESTER.
ALFRED WATERHOUSE, R.A., AND SON, ARCHITECTS.

set forth over and over again, we do not readily adopt them here; it is the old conservatism by which masters persist in antiquated modes and men prefer to waste time on work which could be done three times as quickly by mechanical aids; a conservatism which permeates every trade and business and is manifest on highway, field and river, so that the navvy digs when a machine might do it for him, and the boatman on the reaches of the Thames bails out all day with an old tin when the water might be removed ten times as speedily by a rotary hand-pump. In building operations the race is to the swift, and the cheapest market draws the best prizes. Whether we like them or not, these are the conditions of to-day, and we must either comply with them or go to the wall: or rather, as regards bricklaying, we must go to the wall and there comply with them—to employ a paradox.

Competition
Assessors.

THE reversal of Mr. Norman Shaw's selection as assessor in the Chelsea Public Baths competition has determined several leading architects, combining with the Royal Institute, to formulate some new regulations which it is

the appointment of a second assessor would undoubtedly be advantageous. One fact is very obvious—two assessors will cost more than one, and, however desirable they be, it is probable that the competition promoters will more often than not lean to the side of less expenditure and risk the finer selection: and the proposal to abolish the first premium does not improve matters, for it is now almost always merged into the commission and cannot therefore be transferred to the second assessor's pockets. Therefore, whatever scheme is proposed, the fact remains that more money will need to be spent if two assessors are appointed: and it is a question whether many competition promoters will be prepared to pay three hundred guineas instead of half that sum for an advantage which is more patent to architects than to the average committee man. What appears to us to be in more urgent need of reform is the practice of overriding the assessor's decision, and if the Institute could succeed in stipulating that the committee absolutely bound themselves to uphold the assessor's award they would be removing a great stigma now attaching to the conduct of public competitions.

ROYAL SCOTTISH ACADEMY.

THE ARCHITECTURAL EXHIBITS.

THERE is a certain amount of pleasure in surveying the architectural section of the Royal Scottish Academy this year, there being an indication of improvement in the general appearance of the drawings, which do not look quite the medley of former years. Much praise is due to the Hanging Committee for the manner in which the exhibits are arranged on the walls and the selection of the best works for the central positions. The hanging of the water-colour and architectural drawings in the south room has for some considerable time been a bone of contention between the artists and the architects, and this year another experiment has been tried in hanging a few of the architectural drawings intermixed with the water-colour and black-and-white works in the small octagon. The arrangement has this to commend it, that it brings the architectural drawings more under the notice of the public, and this may induce architects to pay more attention to the draughtsmanship of their drawings, which has been sadly lacking in the past.

Mr. H. J. Blanc, R.S.A., sends three works. His "New Carnegie Baths and Gymnasium," No. 755, and "Extensions of Jenner & Co.'s Premises," No. 757, are both excellent designs, and indicate how a skilful architect can obtain a pleasing effect on broad lines and at little cost. His "New Pulpit and Canopy for the Coats Memorial Church," No. 570, is a delightful piece of work in Mr. Blanc's best style—the drawing, in its way, is quite as interesting as the design, being a very crisp piece of pencil work with delicate colouring, the lower portion being kept darker to enhance the appearance of the pulpit. One seldom has the opportunity of seeing a better drawing, and on this account it is to be regretted that the draughtsman's name does not appear. Mr. G. Washington Browne, R.S.A., is represented by three drawings in the name of the firm—Peddie & Browne. All are large studies for facades, presumably to *fin. scale*. No. 759, "Insurance Company's Buildings, Leeds," is perhaps the most interesting, being Spanish Renaissance in style. No. 750 is for a similar type of building at Dublin which is more broadly handled, but the Florentine treatment of the ground floor appears weak under that of the English Renaissance of the upper floors, notwithstanding the broad mass of wall-surface through the openings. In general grouping No. 754, "Stirling Station Buildings," has a strong resemblance to the central portion of the Wolverhampton Public Library; in style it is Elizabethan, with a central gable flanked by squat octagonal turrets corbelled out at the first-floor level; the central gable appears out of scale and mars an otherwise interesting design. Mr. A. Marshall Mackenzie, A.R.S.A., sends two drawings, No. 660, the tower of "New Greyfriars Church, Aberdeen," the design for which is decidedly original and interesting as a free treatment of Perpendicular Gothic. No. 557, "Kingseat Asylum, Aberdeen," is a good wash-drawing illustrating in a bird's-eye view the villa type of asylum for the insane poor, somewhat after the type of Alt Scherbitz, near Berlin; the various blocks are of pleasing design. Mr. John Kinross, A.R.S.A., sends interior elevations and a sketch of "Tea Room at Buxley" for Sir James Millar, Bart., No. 656. The subject being of little importance, the drawing hardly merits the position it occupies. Mr. J. J. Burnet, A.R.S.A., exhibits two elevations of his "Competitive Design for National Bank Buildings, Glasgow," No. 753. The treatment is very effective, being in a French phase of Later Renaissance.

Of church architecture there is little of importance. Mr. Alexander N. Paterson's "Dunkeld Cathedral," No. 655, is a large drawing showing the interior view as proposed to be restored; small plans are attached showing present and proposed arrangements, also a small sketch of the present interior; judging from these, the alterations will be a great improvement, and Mr. Paterson is to be congratulated on the work. Presumably the traceried east window without cusping is an existing one and on that account is to remain, but it is hardly in keeping with the remainder of the work.



"BRAHAN," PERTH: FIREPLACE IN HALL. BEDFORD AND KITSON, ARCHITECTS.

Messrs. Brown & Watt's "Beechgrove U.F. Church, Aberdeen," No. 544, is a dignified piece of work with lofty tower and spire. The style adopted is Early English rather freely treated, but for this it loses nothing in quality; the plan is of the cruciform type now becoming general amongst the better class of Scotch churches. The belfry stage of the tower is placed entirely above the ridge-level of the main roof, and being detached from the nave it gives considerable dignity to this portion of the work. Mr. P. Macgregor Chalmers's "Sketch Design for Forres Parish Church," No. 566, is hardly in his best style, the tower and spire appearing top-heavy and out of scale with the remainder of the work. Messrs. Stewart & Paterson's "Broomhall U.F. Church, Glasgow," No. 651, is a work in the Decorated style, the general effect of which is somewhat squat.

Of school buildings there are only three examples. Mr. G. P. R. Young's "Central District School, Perth," No. 543, is a broadly-conceived building of three floors and is illustrated by a good pen-drawing by Mr. A. McGibbon. The design is praiseworthy, the effect dignified, and appears to have been obtained at little extra cost; the central portion projects slightly in advance of the general wall face and is further emphasized by moulded stonework around the windows, the sides being kept studiously plain; the lower storey is entirely of rusticated stonework, the upper being in plain brickwork with rusticated stone angles, and the whole surmounted by a well-proportioned cornice. Had a small plan been attached it would have given additional interest to the drawing. Mr. Thomas T. Paterson sends his "King's Park Burgh School, Dalkeith,"



"BRAHAN," PERTH: HALL AND STAIRCASE. BEDFORD AND KITSON, ARCHITECTS.

No. 746. The design is overcrowded with gables and otherwise too fussy to be entirely satisfactory for a school building: moreover, the drawing is hung too high for close inspection, but appears to be well executed in wash. Mr. William C. Laidlaw's "Leith Nautical School," No. 666, is illustrated by plans, elevation, sketch view and a detailed sketch of the main entrance. The design is weak and generally uninteresting, the sketch view showing the unsatisfactory position of the roof lantern, which, however, looks very well on the elevation.

As there were so many competitors for the Hawick Public Library and the result was considered so very unsatisfactory at the time, on account of the assessor's award being discarded, one turns with interest to examine the selected design, No. 563, by Messrs. J. N. Scott and A. Lorne Campbell. The other three hung are No. 657, by Mr. Edward C. H. Maidman; No. 654, by Mr. G. Mackie Watson; and No. 658, by Messrs. Findlater & Murray.

Mr. J. Macintyre Henry exhibits two works, No. 649, "The Gibson Craig Memorial Hall, Currie," the entrance front of which is over-elaborated while the sides are painfully plain. No. 665, "Dunkeld House, for his Grace the Duke of Athole," is a sad indication that even Dukes are seeking cheap buildings. The title of the drawing rather overpowers the design, which, however, is simple and fairly satisfactory. Both exhibits are crude examples of pen work. Mr. R. S. Lorimer's "St. Andrews, Halsington, Finland," No. 650, is a large dwelling-house with office attached, a pleasing group rather Flemish in feeling.

Other drawings worthy of attention are "Cardon, Mortonhall Road, Edinburgh," No. 571, by Mr. Thomas T. Paterson; "Fawside Curriemuir, Colinton," No. 661, by Edward C. H. Maidman; "Drawing-room, Warden House, Coldingham," No. 653, by Mr. James Jerdan (an effective water-colour hung too high); "Proposed House at Findon," No. 652, by William Beattie-Brown, junr., well illustrated by plans, exterior and interior sketches, and a pleasing design of the cottage type; "Hillside, Corstorphine," No. 662, a well-grouped dwelling, though the drawing does not do the design justice; "Waverley House, Gullane," No. 740, by Mr. John Breingan; "Design for a City Club," No. 667, by Mr. J. A. Arnott, a dignified composition; and "Competitive Design for Queen Victoria Memorial for Liverpool," No. 572, by Mr. J. Duncan Rhind.

Mr. T. P. Marwick sends a large plaster model of "New Premises for the National Bank of Scotland, Trongate, Glasgow," No. 631. The building is of four storeys with two attics, and is exceedingly effective. The details are English Renaissance of the seventeenth century, but the general disposition of the openings above the second floor do not coincide with those beneath, almost suggestive of Spanish influence, though all the openings on plan are placed equidistant from the centre of each facade. The windows which come partially under the projecting angle-turrets are a weak feature in the design.

Models of buildings having much detail are certainly to be encouraged if prepared as studies, as one too often sees that a good composition has been partially spoiled by weak or coarse detailing.

While architects should rightly regard drawings as only a means to an end, exhibition drawings are hardly of the same category, and a little extra attention might with advantage be given to their preparation.

"Braham," Perth.—This house was designed by Messrs. Bedford & Kitson, of Leeds, for R. D. Pullar, Esq.; an illustration of the garden front and a ground-floor plan were published in the BUILDERS' JOURNAL for January 10th, 1900. The hall is panelled in oak to about 7ft. and has an oak staircase; above the panelling is a plaster frieze of roses and honeysuckle, modelled by Mr. G. P. Bankart. The dining-room is panelled in oak to a height of 8ft., with panels inlaid with flowers; it has an oak-beamed ceiling and ingle nook, with copper *repoussé* panels by Mr. Edgar Simpson, of Nottingham. The drawing-room has a panelled dado chimney-piece, &c., of cedar, inlaid with mother-of-pearl, and a plaster ceiling modelled by Mr. G. P. Bankart.

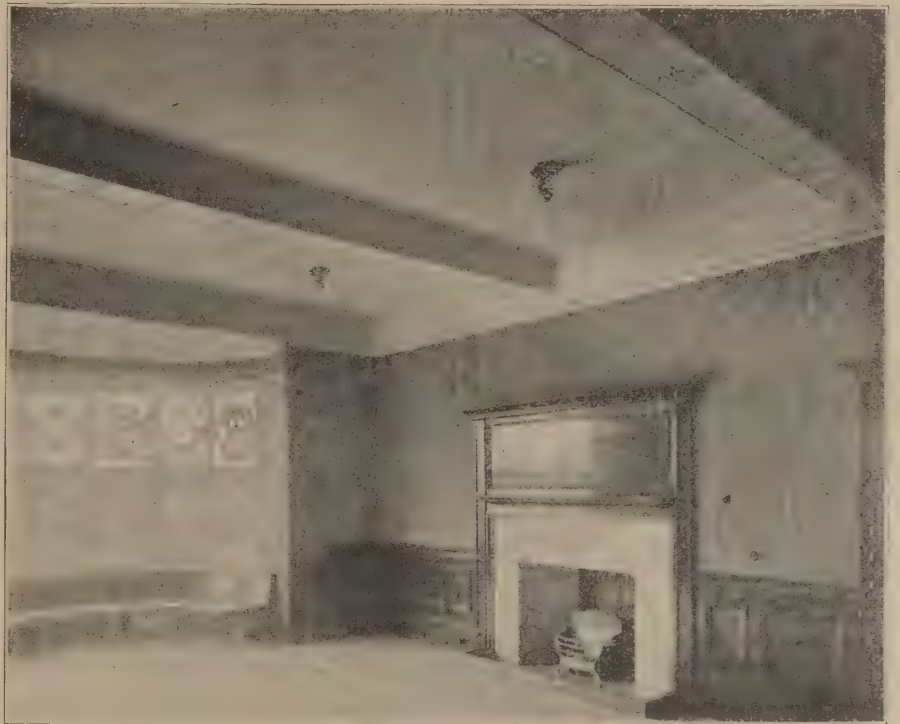
BRICKLAYING AND TRADE-UNIONISM.

Some Facts about the New Westinghouse Works.

MR. J. C. STEWART, building manager of the British Westinghouse Electric and Manufacturing Co., Ltd., has made an interesting addition to the discussion about the effect of trade-unions on bricklaying by stating in the "Times" what has been done at the new works which his company are now erecting at Trafford Park, Manchester. In November, 1901, a regular average of 1,400 bricks per man per day had been reached, and on some days as many as 1,800 bricks per man were laid. A little later work was commenced on the pattern shop, where there are fewer openings in the walls than in any of the other buildings. In the construction of this shop the regular average was 1,800 bricks per man per day. This building is 578ft. in length by 90ft. in width. In no instance are the walls less than 19in. thick and in some instances they are 23in. thick. Mortar was used. All the walls at the works are "piers." In the centre

13ft. in diameter. It has an inside wall, or ring, separate from the outer walls, and consequently there are four faces to the stack. The first 75ft. on the inside is lined with firebrick. Work was started on January 11th. During that month, on account of the extra care required in lining the flue with firebrick, the construction of the flue openings, and the setting of the stone base and coping to the square base, our bricklaying average was only 1,533 and 1,600 per man per day of 8½ hours.

From February 1st, however, we had plain sailing, and the average number of bricks laid per man per day was as follows:—February 1st, 1,275 bricks (half day); 2nd, Sunday; 3rd, 1,393 (two hours lost, accident to brick-hoist); 4th, 1,894; 5th, 1,968; 6th to 8th, no work done on account of bad weather; 9th, Sunday; 10th, 2,022; 11th to 14th, no work, snowing and cold; 15th, 1,278 (half day); 16th, Sunday; 17th, 2,097; 18th, 1,763; 19th, 2,145; 20th, 2,086; 21st, 1,979; 22nd, no work, raining; 23rd, Sunday; 24th, 857 (half day)—20,757 brick-average per man for 10½ days. This shows an average per man per day of, say, nine hours of 1,976 bricks. The men worked 8½



"BRAHAN," PERTH: DRAWING-ROOM. BEDFORD AND KITSON, ARCHITECTS.

of each brick pier is a large "Z" bar steel column. With one exception all the buildings are faced with what is known in the trade as No. 2 stock brick. The exception is the six-storey office building, 250ft. by 50ft., which is faced with No. 1 stock brick. These facts will indicate to men who understand the business the high grade of work and the care it requires. The averages per man mentioned include face brickwork. On common work an average of 2,250 bricks per man per day was reached.

Mr. Stewart continues: "It will doubtless be regarded as a matter of public interest that our bricklaying at Manchester, which seems to us not unusual but which has attracted so much attention in this country, was attained under the direction of our bricklayer superintendents, both of them Englishmen and members of the Bricklayers' Union. The head superintendent has never been to America, but his principal assistant spent five years there, returning here some five years ago, and has remained here ever since. If further evidence be required of the number of bricks that English workmen are capable of laying in one day of 9½ hours, when assisted by up-to-date methods of handling brick and mortar, I may call attention to the brick chimney stack which we are now erecting for the Mersey Tunnel Power Station at Birkenhead. This chimney is to be 250ft. high. Its base is 24ft. square, and its flue is

hours per day up to and including February 11th, and nine hours per day since that date. This Birkenhead average has been made possible, partly, to quote the words of the bricklayers themselves, by 'facilities which are unusual in this country.'

"Some features which seem to have attracted considerable attention at Birkenhead are the methods of outside scaffolding for building the brick stack, and the double platform lift, each platform holding two barrows of bricks, one ascending while the other descends. The time occupied in raising one platform from the ground to the height of the stack, which to-day is 150ft., is only 15 seconds. Another feature which the men regard favourably as helping them to do rapid work is our method of making mortar. Our mortar is made much softer than that commonly used in England, and the bricks are laid by a light pressure of the hand and a light tap of the trowel, instead of by repeated hammering of the trowel to force the brick into place in stiff mortar. By the use of soft mortar we can lay enough with one stretch of the trowel for half a dozen to a dozen bricks. With stiff mortar, such as masons use in this country, it is possible only to spread enough at one time for a much smaller number of bricks, as the stiff mortar leaves the trowel in a mass and will not spread freely. I might add that at the height now reached by the Mersey stack

we have gone beyond the point where it is practicable to continue with outside scaffolding. From this point upwards we shall lay our bricks with greater economy by hoisting the brick on the inside of the stack, and using inside scaffolding.

"All the bricklayers, including the foreman, engaged on the construction of this stack are British workmen, and all of them are members of the Bricklayers' Union. The rate of wages paid to our bricklayers is 11½d. per hour. This is 1½d. per hour above the trade-union rate. The foreman is paid a special rate. The bricks used in the Manchester and Liverpool district are about 20 per cent. larger than those used in the London district.

"Finally, I will say that if our work has been rapidly executed it has been greatly due to the interest that has been taken by the representatives of the unions in securing for us the best men that could be obtained."

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Early Classic Architecture.

YORK.—STUDENT writes: "Kindly name some of the best authorities on early Classic architecture, especially with reference to the Greek Thomson subject for this year, the restoration of the tower of Andronicus Cyrrestes (Tower of the Winds) at Athens."

Stuart & Revett's "Antiquities of Athens," Dilettanti Society's "Antiquities of Ionia" and "Unedited Antiquities of Attica," Penrose's "Investigation of the Principles of Athenian Architecture" and Wilkins's "Antiquities of Magna Græcia."

Cost of Contractors' Railways.

C. R. D. writes: "What would be the cost per 7ft. run of a narrow gauge (1ft. 11in.) railway over fields? Plenty of slate debris is at disposal; the line is to be used for a single horse tram."

As a general rule it is more convenient and economical to adopt one of the ordinary gauges, such as 18in., 24in., 30in., &c., rather than an outside gauge necessitating specially-built rolling stock in lieu of standard patterns. No details are given as to whether the railway is required for purely temporary purposes or for permanent use. A light portable railway (2ft. gauge) suitable for horse traction, comprising steel rails weighing 12lbs. per yard run, bolted to steel sleepers spaced 3ft. apart, and ready for laying, costs from £350 to £450 per mile of single track; if provided with 14lbs. steel rails, from £400 to £500 per mile, and £450 to £550 per mile with 18lbs. rails. This kind of railway can be readily taken up and refixed in other positions, and is eminently suitable for temporary engineering works, quarries, &c. A 2ft. gauge light railway formed with 12lbs. steel rails, 5in. by 3in. creosoted fir sleepers 3ft. 6in. long, including fishplates, bolts, spikes, &c., complete and ready for fixing, costs about £300 per mile, if with 14lbs. rails, £330 per mile, and £400 per mile for 20lbs. rails. The cost of laying rails, sleepers, &c., varies considerably according to the locality, nature and surface of the ground, but for portable railways it may be taken at £120 to £200 per mile of single track, and £150 to £350 per mile for laying light railways with wood sleepers, including ballasting with the materials available on the site. From the data here given it will be seen that the cost of a light tram or railway may vary from 5s. 6d. to 8s. 6d. per yd. run.

T. E. C.

Bonding Brick Piers.

BLUE BRICKS writes: "I wish to carry a floor over a large area on blue brick piers in cement, 13ft. high, each pier to carry a distributed dead load of 25 tons. Would 14in. piers

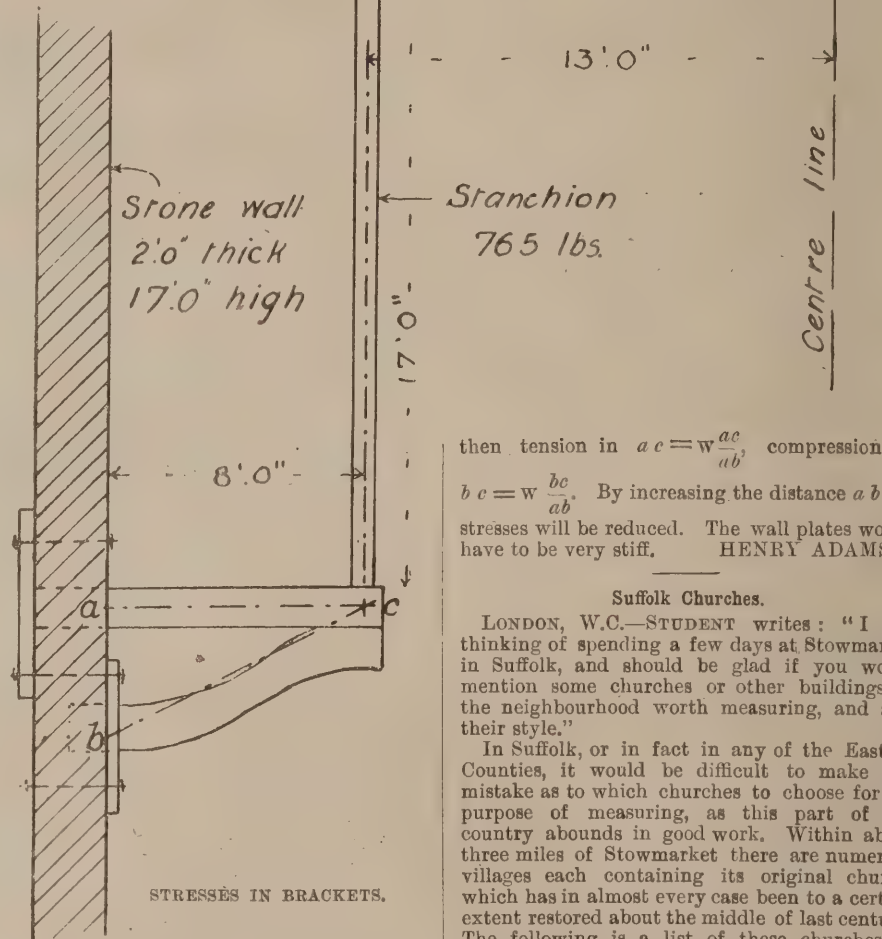
bonded as per sketch No. 1 be sufficient, or should they be bonded as No. 2? Owing to the number of 'closures' required in an 18in. pier as per sketch No. 3, is there much advantage in this over No. 2?" (Sketches not reproduced.)

Neither a 13in. nor an 18in. pier would be safe, though an 18in. by 27in. would. We advise you to use steel stanchions.

Size of Flue for Boiler.

NORTHAMPTON.—BENIX writes "What size flue will be required for an 8-h.p. Cornish boiler? The flue is to be square inside and to go up the side of a building 62ft. high to ridge. How thick should the walls be, and is there any rule for determining the size of flues?"

It would have been more satisfactory if the size of the boiler had been given, or the coal consumption, or the water evaporated per hour, as nominal horse-power is an indefinite commercial term which carries no precise meaning. An 8-h.p. Cornish boiler would probably be about 9ft. long and of 4ft. 6in. diameter, with a furnace 2ft. 7½in. diameter and 4ft. long. The firegrate area would then be 10½ sq. ft., and allowing the chimney flue to be not less than ⅙ of the firegrate area it would be, say, 18in. by 14in.—The inside of flue should be lined with 4½in. firebrick for 20ft. up, not



bonded to the external wall, and with an airspace all round. Above the firebrick lining the flue may gather in, so as to keep the area for gases as uniform as possible. The walls of the flue may be 14in. thick at the bottom in addition to the firebrick lining, reduced to 9in. above the lining, with two courses of Staffordshire blue plinth bricks on the outside, reduced again to 4½in. thick at about 45ft. from the ground, with similar plinth bricks on the outside. This is the minimum that can be adopted; it would be better to increase the thicknesses by 4½in. all the way down.

HENRY ADAMS.

Stresses in Brackets.

ABERDEEN.—D. writes: "Kindly explain how to determine the strains upon the steel bracket shown on the accompanying sketch. It is proposed to carry the upper beam A (which supports a gallery subject to a live load) right through the wall and attach it to a plate on the other side. The lower curved beam B will be similarly attached to a plate abutting against the wall as shown. Both plates will be bolted to wall and to each other. A steel stanchion supporting a steel roof-truss rests on the end of the bracket. Brackets and trusses, &c., occur at 10ft. centres."

Draw direct lines *abc* as shown by stroke-and-dot, let *w* = whole load on stanchion at *c*,

then tension in $ac = w \frac{ac}{ab}$, compression in $bc = w \frac{bc}{ab}$. By increasing the distance *ab* the stresses will be reduced. The wall plates would have to be very stiff. HENRY ADAMS.

Suffolk Churches.

LONDON, W.C.—STUDENT writes: "I am thinking of spending a few days at Stowmarket in Suffolk, and should be glad if you would mention some churches or other buildings in the neighbourhood worth measuring, and also their style."

In Suffolk, or in fact in any of the Eastern Counties, it would be difficult to make any mistake as to which churches to choose for the purpose of measuring, as this part of the country abounds in good work. Within about three miles of Stowmarket there are numerous villages each containing its original church, which has in almost every case been to a certain extent restored about the middle of last century. The following is a list of these churches:—Creeping St. Mary, two miles south-east of Stowmarket, having a Gothic church of the same name; Creeping St. Peter, with the church of St. Peter, containing an old font which had some of its carving broken by Cromwell's soldiers; Harleston, two miles and a half to the north-west, with St. Augustine's Church, an ancient thatched building having Early English and Decorated tracery and consisting of a nave, part of which is separated off by a rood-screen to serve as a chancel; Little Tinborough, three miles to the south-west, with the Early English church of St. Mary; Onehouse, two miles to the west, with the church of St. John Baptist, which belongs to the Decorated period and

contains an ancient font; Haughley, three miles to the north-west, with the church of St. Mary, containing Decorated and Perpendicular tracery, also portions of an ancient castle of the same name destroyed in 1173; Needham Market, three miles and a half to the south-east, with the church of St. John Baptist, built in 1460, a very good Perpendicular work having a carved open wood roof—also Theobald's Grammar School, founded 1632. In Stowmarket itself is the church of St. Peter and Mary, a large cathedral-like building of the Decorated and Early English periods. The old vicarage dates back to Tudor times, and Thorney Hall (near the station) to a more distant date still, being the seat of the King's Bailiff from the commencement of the Norman Period to Henry I.'s reign. A portion of the Hall still stands, although now converted into maltings. Somewhat farther away, but within the area of a bicycle ride, lie Ufford (near Woodbridge) in the one direction, and Long Melford in the other, the church in the former village being famous for containing the finest font-cover in England, while the church at Long Melford is one of the best examples of flint rubble-work within traceried panels of freestone. Both are of the Perpendicular period.

G. A. T. M.

Strength of Floor.

LONDON, W.C.—B. P. writes: "(1) Can a floor composed of 1½ in. boarding be safely supported by being housed in. into a 9 by 6 beam at a distance of 2 in. from the underside? As little as possible of the beam must show beneath the floor, and the construction must not be costly. Would a 2 by 2 by ½ angle-iron be better screwed to the side of the beam? (2) Would two thicknesses of 1 in. boarding be sufficient for the outside wall of a bay window with an air-space of 2 in., or could you recommend some sort of filling?"

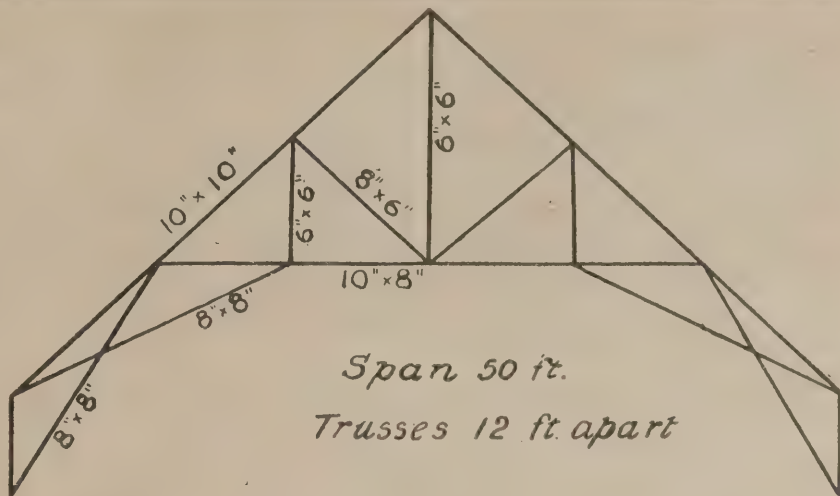
(1) A 1½ in. floor might be housed into a beam as shown on querist's sketch (not reproduced) if the span of the floor boards did not exceed 5 ft., but it is difficult to see what useful purpose this would serve. The lower the housing groove is made in the beam the more the beam is weakened. A 2 by 2 by ½ angle-iron is a section that is not made and would be no better than an arris fillet or rectangular fillet of wood, as the strength would depend upon the fixing. (2) If the building is of a very cheap character and not subject to any by-laws or regulations, two thicknesses of 1 in. tongued boarding with 2 in. of sawdust between might be used for the walls of a bay window. HENRY ADAMS.

Constructing Vaults under Public Roads.

CROYDON.—J. D. writes: "What is the law, if any, which gives the right of freeholders to construct vaults under the highway and to have openings giving access to them?"

The right to construct vaults under public roads and to make openings from them into the public thoroughfare depends primarily on the question of the ownership of the land in which the vault is excavated. If querist looks at his lease he will see the boundaries of his property. Very frequently the plot leased extends to the middle of the public thoroughfare, in which case, excepting the rights of the corporate bodies in whom they may happen to be vested, and subject also to any by-laws which may have legally been made concerning the building of such structures, and to the various powers conferred on urban authorities as below set out, querist has a perfect right to make the vault. If, however, his boundary is the front wall of his house, and if in order to make the vault he would have to excavate under the public thoroughfare, by doing so he would commit a trespass. I would advise him under these circumstances to negotiate with the bodies in whom the road is vested for powers to carry out the works he desires. He will in any case have to conform to their by-laws and build subject to any existing mains for water, &c., which they may have laid. Under the 26th section of the Public Health Act of 1875 an urban authority may prevent the construction of any vault under the carriageway of any street without their written consent. They may, moreover, pull down any building which has been erected in contravention of this section.

W. JOHNSON-ROBERTS.



TIMBER ROOF-TRUSS FOR PUBLIC HALL.

Timber Roof-Truss for Public Hall.

ILKLEY.—R. F. writes: "Kindly answer the following question set at the R.I.B.A. final examination:—A timber roof-truss to span a public hall 50 ft. wide, no tie-beam allowed. (I only want a rough sketch just to indicate the form of truss, with a few of the scantlings.)"

The accompanying sketch shows the outline suggested for the roof-truss in a form that will admit of some ornamentation. Where cut away for halving, the joints should be strengthened by iron straps. The scantlings are approximate only.

HENRY ADAMS.

Right of Authorities to Reject Plans and Compel Sale of Land.

PONTEFRAC.—DOUBTFUL ONE writes: "My client wants to pull down his present ancient shop and rebuild at the corner of a narrow street in the busy part of a town, which street the authorities desire to widen if he does pull down the shop. Can the authorities refuse to pass my plans if my client does not consent to set back? If not, can they compel him to set back and sell to them what land they want?"

Yes; if he pulls down and desires to rebuild he must, if the urban authority so desire, set back his new building; but he is entitled to compensation. (See Public Health Act 1875, section 155.) Some Acts affecting corporate public bodies, e.g., the Improvement Acts, give power in certain cases to rural and urban councils to make legal by-laws compelling a person rebuilding a house to set it back. The authorities have no power at common law under the circumstances mentioned to compel your client to set back his house on rebuilding, but they may do so under the Acts above mentioned. You should obtain a copy of the by-laws applicable to the town in which the building is proposed to be erected, and see if any rule or regulation has been made to enable the authorities to do as you think they may; and also ascertain from them under what Act of Parliament they are proceeding.

W. JOHNSON-ROBERTS.

Descriptions of Plots of Ground Surveyed.

J. B. writes: "Kindly name a book giving the principles on which surveyors proceed in framing verbal descriptions of plots of ground surveyed, or state the rules which should govern such descriptions. I have not been able to find any book which deals with this question. In the division of, say, the area of a county council into wards for election purposes I believe it is the practice to commence at a well-defined point and thence to perambulate the whole area, following the directions of the boundaries by the changes in the points of the compass until the point first described is again reached. But in the descriptions of plots of ground for building purposes for insertion in conveyances I believe a different principle is followed."

The only principle worth following is that of common-sense. There seems to be no rule upon the subject nor any universally-adopted practice. The great thing to do is to make the verbal description as clear as possible, or not to take

the place of the plan but to be read together with it, neither plan nor description being complete by itself. Legal phraseology should be avoided as far as possible and the description be made terse and unmistakable. Such verbose descriptions as the two examples cited (but not now given) are to be avoided as serving to confuse rather than to expound.

G. A. T. M.

Brick Chimney Shaft.

EDINBURGH.—CHIMNEY SHAFT writes: "The nearest high building to the boiler chimney shaft shown on the accompanying drawing (not reproduced) is one 40 ft. to the roof and 200 ft. distant from the shaft. Is the internal diameter of the flue sufficient? It is not at all likely that another boiler will ever be installed. Is it desirable that the foundations of the shaft should be kept clear of the foundations of the adjoining walls of the building, the subsoil being stiff clay?"

It is not usual to bond in the firebrick lining with the shaft itself. There is generally a space of 1½ in. left between the two to allow for expansion and contraction, this space being protected from falling dirt and soot by an oversailing course just above the lining. It depends upon the nature of the subsoil whether the foundations of the shaft should be kept clear of the adjoining building; the important point is not to overload on that side so as to cause tilting. The size of flue may be determined from the size of the firegrates. In this case 2 × 2 ft. 4 in. × 6 ft. = 28½ sq. ft., and allowing ⅓ of firegrate area the flue would require 3.56 sq. ft., which would be given by a diameter of 2 ft. 1½ in. By another rule:—Area chimney sq. in. =

$$\frac{120 \times \text{grate surface sq. ft.}}{\sqrt{\text{height feet}}} = \frac{120 \times 28.5}{\sqrt{50}} = 484,$$

which is given by a diameter of 22 in.; so that 2 ft. internal diameter would probably be sufficient for one boiler of the size given when burning ordinary steam coal.

HENRY ADAMS.

Uralite.

ONE ANXIOUS TO KNOW writes: "A contemporary journal says: 'Uralite, a substance made of asbestos fibre, will be used in the construction of the building for the sake of coolness. The 'Century Dictionary' says: 'Uralite is a mineral which has the crystalline form of augite, but the physical properties and especially the cleavage and specific gravity of hornblende.' Evidently this latter uralite is not that first referred to. Can you enlighten me?"

This material is made by the British Uralite Co., Ltd., of 37, Lombard Street, E.C., from whom all particulars can be obtained.

Drainage of Burial Ground.

SOUTHAMPTON.—STUDENT writes: "I wish to thoroughly study the drainage and laying-out of burial grounds. I know that the Local Government Board require the ground to be drained to a depth of 8 ft., but does this apply to the whole area? In that case how is the drainage system to be laid, what pipes (and sizes)

are required, and how is the ground water disposed of after running through the pipes? How long after laying and covering up the drains should the ground be left before it is in a state to be used? Should the paths, &c., have a separate system of drains to carry off the storm-water? Please mention any books dealing with the subject."

Speaking generally, the control of burial grounds is vested in the Home Office, though under the Public Health (Interment) Act, 1879, the Local Government Board have to be consulted when cemeteries are established by a sanitary authority. No new burial ground may be opened without the licence of the Secretary of State, and this will only be given after full enquiry and inspection of the proposed site. The Home Office has therefore issued regulations under the Burial Acts of 1852-3-4-5-7 and 9, 1860 and 1871, together with a list of "Suggestions" as to situation, soil and drainage, paths and roadways, fencing and planting, size and depths of graves, reopening of graves, burial in vaults, size of burial grounds and other matters germane to the question. These regulations and suggestions are generally in line with the memorandum issued by the Local Government Board (December 13th, 1880) on the same subject, the following extracts from which may be of value: "The sanitary requirements for a cemetery . . . may be summed up under four headings—(1) suitable soil and proper elevation of site; (2) suitable position, especially with regard to houses and sources of water-supply; (3) sufficient space; (4) proper regulation and management." In answer to your enquiry, the soil should be "of an open porous nature, with numerous close interstices through which air and moisture may pass in a finely-divided state freely in every direction. The soil should be easily worked, yet not so loose as to render the work of excavation dangerous through the liability to falls of earth. It should be free from water or hard rock to a depth of at least 8ft. If not naturally free from water, it should be drained, if practicable, to that depth: to this end it is necessary that the site should be sufficiently elevated above the drainage level of the locality, either naturally or where necessary by filling it up to the required level with suitable earth." The "Burial Act" of 1855 requires that no new burial ground shall be opened within 100yds. of a dwelling-house, unless with the written consent of both owner and occupier. But for cemeteries under the Public Health (Interment) Act, 1879, with which the Cemeteries Clauses Act of 1847 is incorporated, this distance must not be less than 200yds. Coming now to your questions in detail, you will gather that the rules as to drainage soil, &c., are only intended as a guide and are subject to the discretion of the inspector who will be sent to view the site and the trial holes which must be dug for him to a depth of 8ft. The drainage applies to the whole area (unless there exists a lower part which is capable of being filled up), and of course this means that land incapable of drainage to that depth will not be sanctioned for use as a burial ground. You will find several methods of deep drainage mentioned in the Appendix A, No. 2, to the Home Office Rules issued May, 1887. The drainage of surface-water is also dealt with in the same document, and this must of course be provided for in all soils incapable of taking it by percolation. It is not essential, though perhaps desirable, that the footpaths should have an entirely separate system of drainage, but this could probably be managed by conducting the water from the paths to various selected points, where it could be discharged by shafts into the deep drains. Grates with dirt boxes or catchpits should be provided to avoid the possible stoppage of the deep drains by detritus. The paths are best formed of asphalt or some other material which will be dry and fit for service in all weathers. You will find the various "Burial Acts" dealt with very fully in "The Law of Burials" by J. B. Little, a book published by Shaw & Sons, price 17s. 6d., and the regulations to which I have referred are also set out in that work. The actual details of the "drainage" operations are to be found in any book on land drainage or in "Specification" No. 5, under that heading.

G. S. M.

Patents.

SUSSEX.—G. A. W. C. writes: "Referring to your leader on the new Patents Bill, would it be best to wait until this is made law or proceed at once? Will the expenses be any greater than they are now?"

The new Bill, if passed, would not come into operation till next January and would increase the fees by £1. The grant of a patent under the Act would be no more valuable than under the existing law, though by the preliminary examination you might be saved the expense of spending money on an anticipated invention. If you are in a hurry, it would be as well to take out your patent now.

Nicholson's "Principles of Architecture."

EAST HAM.—F. F. writes: "What is the value of Nicholson's 'Architecture'? I have the three volumes—vol. 1, on Mathematics, &c.; vol. 2, on Roman and Grecian Mouldings and the Projection of Shadows; and vol. 3, on Ornaments and the Orders of Architecture. They are dated 1795-1796. Are they standard works?"

The book you refer to is Nicholson's "Principles of Architecture." It is a very early edition, and later editions have been published so late as 1848. The actual selling value would be about 7s. 6d. A good deal of the matter in it would be more or less obsolete, and is replaced by such books as Gwilt's Encyclopædia.

Railing around Hatch.

FRASERBURGH.—BROCH writes: "Do you know of any means by which a railing to pull up and down could be placed around a hatch at the foot of some stairs in a shop, so that people might be prevented from falling down when the hatch was lifted?"

If you apply to the Bostwick Gate and Shutter Co., Ltd., Baldwin's Gardens, Gray's Inn Road, W.C., we think they will be able to supply you with what you want.

Quantities included in Contract.

KIRKLEY.—G. L. writes: "The following notification appears in quantities: 'These quantities will, with the drawings and general conditions, form the basis of contract. Should there be more or less measure than is here given there will respectively be an addition to or a deduction from the contract.' Is the quantity surveyor or building owner liable? To whom should I send in an account, if necessary?"

The building owner is liable, the quantity surveyor being the employee of his agent, the architect. Send in the account to the architect.

Responsibility for Omissions in Quantities.

TEDDINGTON.—T. W. L. writes: "Is a quantity surveyor, employed independently by the architect, responsible for an error of omission in quantities, or can he claim the extra value of work done from the building owner?"

If the quantities do not form the basis of a contract, and they generally do not, you cannot recover for omissions, as you were supposed to assure yourself of their accuracy before tendering.

Preventing Varnish "Cissing."

KINGSTON-ON-THAMES.—KINGSTON writes: "What is the cause of varnish cissing on grained work? It has occurred on imitation oak and mahogany, and also on a plain colour largely composed of stainings with hardly any lead. Harland's copal varnish is used, the surface being first rubbed over with whiting. By 'cissing' is meant that the varnish, instead of flowing together in a body, separates into what may be called lines of bubbles, leaving part (perhaps half the work) in streaks without the varnish."

The cissing is in our opinion due to a greasy or fatty substance in either the stainings or the driers, probably the latter, but as we are ignorant of the ingredients we must leave you to judge. Turpentine and oil are often greasy, and turpentine should never be used in driers where varnish is intended. Litharge and sugar-of-lead ground in oil (linseed oil) are the best driers. The cissing can be prevented by covering the surface firstly with a thin paste of whiting.

Determining Specific Gravity of Cement.

LEICESTER.—PUZZLED writes: "Please explain in a simple way how to obtain the specific gravity of cement; also, of what use is the knowledge?"

The specific gravity must not be confounded with the weight of powdered cement in air. The specific gravity of cement, of course, cannot be found by putting it in water, as it would slake. The usual method, therefore, is to use benzine, petroleum spirit or turpentine. The last is the best. A bottle with a graduated neck is filled to a certain mark with turpentine and weighed, and a certain weight of dry cement is then added gradually so as to let the air bubbles escape. The increase of volume is noted, and from these data the specific gravity is found. The specific gravity of a fresh cement averages about 3.15, and after exposure to air for some time is about 3.10. The specific gravity is an accurate measure of the weight of a given volume of cement. It is one of the several necessary tests to judge of the quality of a cement and should not be omitted.

Books on Building Construction.

W. M. writes: "Kindly recommend books for the examination in Building Construction, Advanced Stage, held by the Department of Agriculture and Technical Instruction, Ireland. I want a book on quantities just sufficient for the examination."

Rivington's "Notes on Building Construction, Vols. I. and II." and J. P. Allen's "Building Construction," also our articles on Building Construction; and if you have access to a library consult the works on the branches of building construction which are given in Mr. B. T. Batsford's "List of Standard Books," to be obtained from him at 94, High Holborn, W.C.

Ventilation of Small Schoolroom.

LONDON, N.W.—FENLAND writes: "Would several Tobin air-inlets with air flues in the chimney stacks be sufficient for the ventilation of a small school? The room is about 31ft. by 25ft. by 14ft."

The method proposed would be very efficient.

Approximate Cost of Town Hall.

SOUTHPORT.—H. T. C. writes: "What would be the approximate price per cub. ft. of a town hall with, say, three elevations to streets, in Yorkshire stone, fittings to be good but not extravagant?"

An approximate price would be 1s. 3d. per ft. cube.

Removing Efflorescence on Brickwork.

LONDON, S.W.—INSURED writes: "Referring to the removal of white efflorescence on brickwork (see p. 451 of the issue for February 12th), what acid should be used for red bricks and for stocks, and how should it be applied?"

Commercial sulphuric or muriatic acids are best. Mix about 1 volume of acid with 10 of water and apply with a stiff brush; afterwards clean down with water. The acids rot the brushes; therefore, use common ones and those bound with cord in preference to wire.

Party Walls.

LONDON, S.W.—OCCASIONAL CONTRIBUTOR writes: "My client is desirous of erecting a billiard-room over his kitchen. This latter is a top-lighted building in the rear of his house, and is separated from his neighbours' kitchen by an 18in. wall on either side. Supposing I am fortunate enough to obtain the consent of the adjoining owners to raise the party walls, am I under an obligation to build the new walls of the same thickness? For my purposes a 13in. wall is sufficient, and I would like if possible to make its external face in the same plane as the internal face of the neighbouring kitchen wall. This would result in a gain of 9in. in the width of the billiard-room."

We are of opinion that a 9in. wall would be sufficient, but you must not build on your neighbour's half of the party wall without obtaining his permission, which could probably be done for a small consideration.

Views & Reviews.

Building Trades Accountancy.

Whilst builders' book-keeping, if thoroughly done, is always a complex matter, literature of the subject is scanty and its utility questionable; and we are sorry to have to apply the same description to the latest effort in this direction, issued as the third volume of "The Accountant's Library." This book is intended, according to the preface, to supply the student with specialised information, "while each volume will be the work of one who has made that particular class of accounts more or less a speciality."

Accountants, *quâ accountants*, love to revel in a maze of bewildering detail; and whilst this may be forgiven when some really useful purpose is served, it cannot be when the ultimate result is little more than a sinful waste of expensive stationery and clerical labour. Passing from the general to the particular, we will now proceed to analyse the fifty-four pages of "model" accounts, following which are seventeen pages of "modifications," adapting the former to the needs of a small builder.

Priority of place is given to The Register of Tenders, p. 3, and our author proceeds to show how prices should be arranged. "Suppose that the specification requires 900 sq. yds. of brick-work, and that the builder is willing to do this at 6s. per sq. yd. He will instruct the clerk in charge of the Register to divide the 6s. (say) thus:—

Wages - - -	at 2s. 6d. per square yard.
Material - - -	" 3s. 2d. "
Establishment charges - - -	" 3d. "
Profit of - - -	" 1d. "

6s. 0d."

Further: "Some builders prefer to base this calculation" (establishment charges) "on the total estimated cost, while others arrive at the amount from the number of hours the workmen are expected to spend on the work" (italics ours). And as an example of hair-splitting accountancy the following, read in conjunction with the foregoing, is worth recording: "for the time occupied, and not the amount paid, is the true principle to work on" (italics author's). As regards the example given of the Register, we need only remark that we have never seen one arranged or kept thus, and never expect to. Passing to the Purchase Journal, p. 6, we find the bulk of the space occupied by columns for analysis. The Accounts Rendered Book, p. 8, is next dealt with, which, says the author, "corresponds with the Sales Journal of a trading concern. It is written up from the invoices before they are sent out, &c." We were unaware that a building business was other than a "trading concern," and we strongly object to the cart-before-the-horse style recommended. Passing to the Wages Book, we find that daily returns and daily entries are called for, and provision is made for a Sub-Wages Cash Book to record "the advancing of money to workmen on account of their wages." The example of the Wages Book, p. 14, is an elaborate affair, with special columns for recording "subs," and the apportionment of establishment charges. The Contract Journal provides *inter alia* for the workmen's names, and daily hour totals are duly recorded—a totally unnecessary refinement; and as the example given, p. 16, contains only entries relating to jobbing work, we must confess we are somewhat at a loss to reconcile matters. We must object to the author's method of referring to each job, contract or jobbing, by number only. Those who have had experience of the building-trades operative's special faculty for muddling things up generally, even when name and number are both given, will appreciate this point.

The Petty Cash Book exemplified, p. 21, is "kept on the imprest system" (tabular); and where the entries in this book are analysed and copied into the "main" Cash Book, this system can be recommended. The Stores Issued Analysis Book, p. 27, we regard as quite outside the range of practical bookkeeping. The following is an extract from the instructions accompanying it: "When stores [materials] are required for any particular work, application is made at the office and an order is made out and signed by a responsible person . . . differently coloured paper for contracts, jobbing,

and cash sales . . . and handed to the storekeeper as his authority to deliver the goods. . . . In the case of contract or jobbing orders, the cost price will be shown . . ."

The Stores Returned Analysis Book, p. 28, is as unpractical as the foregoing, and the use of this book for materials transferred from one job to another is scarcely to be recommended. The mention of Plant, p. 30, betrays that our author is on shaky ground, the subject being dismissed in twenty-one lines. To the statement that "an ordinary Transfer Journal and Ledger are sufficient to meet the case" exception will be taken by everyone who has had to do with this worse-than-troublesome phase of builders' book-keeping. The arrangement of the Contract Ledger, p. 35, though on ideal lines, is incomplete, but is one that finds scant favour among builders, and it must be confessed that should the cost of any job require analysing it will be

produce its due ratio of profit. And coming again to the establishment charges question—one that the author seems to unnecessarily labour—we find on p. 69 some examples of their apportionment—£24,300 bearing an addition under this head of £800, an amount of £29,830 being debited with £250, whilst £34,594 has to bear a load of £1,030. It is not intimated if these amounts are or are not arrived at under the "fairest" total - of - hours system; but the number of builders, if indeed any, making it a practice to appropriate these charges to the costs of contracts is small; and where such appropriation is made, our opinion is that the total cost would be a pretty sure and fair basis upon which to make the calculation. Moreover, as it is quite possible through office extravagance to convert a gross profit into a nett loss, we should prefer a Trading Account showing the *gross* profit earned on the year's operations, leaving all



PALAIS DE JUSTICE, BRUGES. DRAWN BY E. STANLEY MITTON.

less ultimate trouble to dissect the concrete mass of detail than to tabulate the entries as made. The arrangement of the Jobbing Ledger, p. 37, is not practical from a builder's point of view; and the following "dark saying" occurs in the accompanying description: "The main object in view in keeping the Jobbing Ledger is to have the details of the cost in a convenient form to assist in making out the invoice and the price charged therein, and not for guidance in future tenders." Passing to the specimen Journal Entries on p. 44, we protest against detail figures being extended into the posting columns, fail to appreciate the ruling-off lines in the body of the said columns, and question the wisdom of showing inaccurate totals. We fail to see the utility of the "Jobbing" Profit and Loss Account, p. 52, wherein every item of jobbing is enumerated. At best it is but a useless piece of nicety, as every jobbing work should

deductions by way of "losses" to the Profit and Loss Account.

The book is well got up and printed on good paper, but we are afraid that it will be of slight use to accountants so far as giving them an insight into builders' book-keeping is concerned, and of little use to builders except to give them an insight into the methods of pure accountancy. Twelve months' experience in a respectable builder's office would have enabled the author to have shorn his work of much of its superfluous detail; and it is to be regretted that this and similar ventures are not either compiled in conjunction with or submitted before publication to someone who is, before everything, thoroughly conversant with the requirements of his trade or profession, and with the methods of accountancy second.

H. E.

"Builders' Accounts," by J. A. Wallbank, A.C.A. London: Gee & Co., Moorgate Street, E.C. Price 3s. 6d. nett.

The Greatest Italian Sculpture.

The three great ages of sculpture have satisfied aesthetic demands in three different ways—the Greek of the fifth century B.C. by dominating the material and the technique by the form; the mediæval of the thirteenth century by guiding men to greatness through Nature; and the Renaissance of the fifteenth century by devoting the greatest attention to the colour and surface treatment of the material. It is with this last period that we are now concerned.

The Early Renaissance embodied the inspiration communicated through the Latin classics, and to it belong the portrait, the relief and the tomb. We have the origins in Nicola Pisano, whose pulpit in the Baptistery at Pisa (of which building he was the architect) shows a release from the older standards; it is a six-sided box supported on six pillars of different-coloured marble, connected by Romanesque arches having Gothic cusps. Niccola trained his son and other workmen and thus was formed the "Pisan School," made famous by its three master-sculptors Giovanni Pisano, Andrea da Pontedera and Orcagna the Florentine. In following the development it is interesting to note the difference between Niccola's pulpit and Giovanni's, the latter being thoroughly unarchitectural and overloaded with detail, a distinction which shows how much the father was ahead of his age, whose true affinity was with Gothic. The next name that attracts our attention is that of Jacopo Della Quercia, who marks the transition between the Pisan and Florentine manner: "so striking was the effect of his style in his first masterpiece, the Fontegaja of Siena, that he was straightway called Jacopo of the Fountain"; his tomb of Ilaria del Carretto in the cathedral at Lucca is a beautiful work, its frieze of garland-bearing cupids being a vanguard of the cherub host of Renaissance art. Then we come to Ghiberti, who outclassed both Della Quercia and Brunelleschi in the competition for the bronze doors of the Baptistery at Florence—those "Gates of Paradise" (as Michelangelo called them) on which he spent fifty years—his marvellous life-work. Following him, Donatello, with a great range of technique, produces his St. George of Orsanmichele, his shrine of the Annunciation in Santa Croce at Florence, his bronze David, the Gattamelata equestrian statue at Padua (culminating product of his third period); and the two bronze pulpits for San Lorenzo, Florence, in the designing and beginning of which he spent his last years. Next we reach Luca Della Robbia, the most really Greek of them all, with his "blue and white divinations of the Hellenic," his knowledge of the limitations of the material, and his devoted attention to form.

The influence of these great men on the minor sculptors of the Early Renaissance is very marked, and many fine works are produced through its inspiration. We however pass by the marble workers and the bronze workers to the men of the Late Renaissance. Taking Andrea Sansovino and his pupil Jacopo Tatti as the sculptors who marked the transition between the two periods, we come to Giovanni da Bologna. We see copies of his bronze Mercury on every hand—that "child of Heaven with winged feet"—and it is doubtless his best-known work; but the marble group at Florence representing the rape of the Sabinas is even more alive with motion, though perhaps it transgresses the laws of glyptic art. Benvenuto Cellini follows—"type of the Renaissance braggadocio, man of lusts and lies and poetic fancies, true artist always, and the best goldsmith of his times"; the last fact accounting for the effect of his Perseus, a work marred by its detail, which is more appropriate to a salt-cellar than the pedestal of a large statue. Finally, we arrive at Michelangelo, that wonderful genius who created the Pietà at St. Peter's, Rome; the David familiar to all art students; and those great tombs in San Lorenzo at Florence. "His genius leaps to that culminating point in the representation of form where it is possible to create figures of the highest expressive value, which are ideal in proportion and even in structure, and which, without breaking Nature's laws, extend them to combinations which are not Nature's, but are the creations of the sculptor."

This book illustrates all the chief works men-

tioned and the illustrations are so placed that they occur opposite the matter relating to them, a most desirable requirement, but one often neglected. The author has written an introduction "On the Enjoyment of Sculpture." While it is true that the historian often fails to appreciate art because he is not in sympathy with it, and some men value an orchid more for its rarity than for its intrinsic beauty, we consider that our author is wrong in allowing his feelings alone to dominate his judgment. This is illustrated by his statement that "unless the architect who studies Brunelleschi's dome feels the unique beauty of its wonderful curve, unless the archaeologist who dates a Greek vase is in some degree teased out of thought by its loveliness of form, he is as blind to primary values as were the Roman peasants who made a quarry of the Forum and burned antique marbles to procure the lime for their wretched huts."

We are becoming emancipated from the belief that architecture is governed by no laws and from the misdirected enthusiasm which asserts that architecture is detail and not construction; and in the other arts the same considerations apply, however much some artists may think that they work in a region where there are no laws but those of sight.

"Italian Sculpture of the Renaissance," by L. J. Freeman, M.A. London: Macmillan & Co., Ltd., price 12s. 6d.

The Art of Building.

Mr. Dobson's admirable little book has now gone into fifteen large editions; the last has been revised to date by Mr. John Parnell Allen, as the author resides in New Zealand. Mr. Allen's qualifications for the work are considerable, he having written a very able and clear elementary work on building construction. To the book under review he has contributed a useful chapter on "An Ideal Dwelling." Mr. Dobson's style adds interest to the driest facts, and his work is a very useful and necessary one for a beginner to read. The book makes no claim to comprehensiveness or to be a textbook, but by being short it gives the student a fairly wide grasp of some of the chief considerations in good building and their interrelation. We could wish that Mr. Allen had as clear and pleasant a style.

"Rudiments of the Art of Building," by Edward Dobson, M.I.O.E. Revised by John Parnell Allen. London: Crosby Lockwood & Son, 7, Stationers' Hall Court, Ludgate Hill. Price 2s.

A New Rome.

What changes have been made since Shelley wrote from Rome in 1819: "The ruins of the ancient Forum are so far fortunate that they have not been walled up in the modern city. They stand in an open, lonesome place, bounded on one side by the modern city, and the other by the Palatine Mount, covered with shapeless masses of ruin. The tourists tell you all about these things and I am afraid of stumbling in their language when I enumerate what is so well known." The excavations have altered what was "so well known," and tourists need to revise their history by such a book as this one by Professor Lanciani, who, with Commendatore Boni (now directing the excavations), has done more than anyone to confirm theories and traditions by actual discoveries and also to prove the fallacy of some contentions by historians and archaeologists. The earlier excavations stopped as soon as a paving-stone or a brick or marble floor was found; but since then deeper levels have been reached, with most surprising results. In 1882 when the temples of Julius Cæsar and Castor and Pollux were cleared away no search was made below the level of the street pavements, yet six years afterwards Professor Richter went 9in. lower and discovered the remains of the Arch of Augustus. The Heroon of Romulus in the Comitium was another discovery due to perseverance, a monument about which so much discussion centred. The object of the present excavations is to reach the early imperial, the kingly, or even the prehistoric strata and in considering these it is well to remember the extensive rebuilding by the various emperors after the fire of 283 A.D. which seriously injured or completely destroyed the buildings in and around the Forum, the Comitium and the Sacra Via; the last was afterwards transformed by Maxentius from a narrow lane to a great avenue 67ft. wide. Many particulars about these dis-

coveries have been published in our columns from time to time, so that there is no need now to repeat them: suffice it to say that they are all dealt with by Professor Lanciani, more fully, of course, than has been done elsewhere. Other chapters deal with "The Truth about the Grave of St. Paul," "Jewish Memorials in Rome" (the Jewish colony, however, is now dispersed), "English Memorials in Rome" (which, so far as existing monuments are concerned, date back to the first century of the Empire) and "Scottish Memorials in Rome." The book, which is illustrated by numerous illustrations, is written in a most interesting manner and is a fitting addition to the author's other works.

"New Tales of Old Rome," by Rodolfo Lanciani. London: Macmillan & Co.

Correspondence.

Eastbourne Technical Institute Competition.

To the Editor of THE BUILDERS' JOURNAL.
LONDON, S.W.

SIR,—Referring to the letter on p. 52 of your last issue, the tenders given were not for "the first premiated design," but for an entirely new design necessitated by further instructions from the Council.—Yours truly,

PHILIP A. ROBSON, A.R.I.B.A.

Builders' Notes.

The Plumbers' Registration Bill was read a third time and passed in the House of Lords last week.—Thirty master and operative plumbers were recently examined at King's College for registration under the National Registration of Plumbers by the Worshipful Company of Plumbers. The practical test included lead bossing and the making of plumbers' joints, &c. The examination questions included the subjects of contamination of drinking water from faulty connections, roof covering, arrangement of bath, sink and closet wastes, drainage of town houses, and disconnection with sewers. Sixty per cent. of the masters and 40 per cent. of the operatives succeeded in passing the examination.

Storage of Timber.—A meeting of the London Section of the Timber Trade Federation was held at the London Chamber of Commerce on March 4th to decide what action should be taken in the interests of the London timber trade in view of the London County Council having asked the Metropolitan Borough Councils for an expression of their views on the necessity for further legislation with reference to the alleged danger to which dwelling-houses are exposed by reason of the storage of timber on the roofs of buildings and against the boundaries of yards where such boundaries are adjacent to dwelling-houses. Mr. C. J. Morgan, vice-president, occupied the chair. Mr. G. T. B. Cobbett contended that the existing law sufficiently met the requirements of the case. After discussion it was moved by Mr. Cobbett, seconded by Mr. John Grover (builder), and unanimously resolved: "That in the opinion of this meeting as the London Building Act, 1894, sufficiently deals with the question of the storage of timber no fresh legislation is necessary for the safety of the public."

The Ventilation of the Houses of Parliament is to form the subject of an investigation by a Committee to be appointed before Easter. Samples of the atmosphere were taken by the Board of Trade officials last week.

Mr. Walter G. Doolin, M.A., F.R.I.B.A., of Dublin, died recently. He was the son of the late Mr. William Doolin, one of the leading quantity surveyors of his day. After an apprenticeship to his father he became a pupil of Mr. J. J. O'Callaghan, architect, of Dublin. From Dublin he went to London, where he entered the offices of the School Board, and afterwards became assistant to the late William Burges. He returned and started practice in Ireland early in the 'seventies. Amongst the many large churches erected from his designs we may mention Lismore Cathedral, Nenagh, New Ross, Castlebar, Killorglin, Castlemaine, Cloghane and Borrisoleigh.

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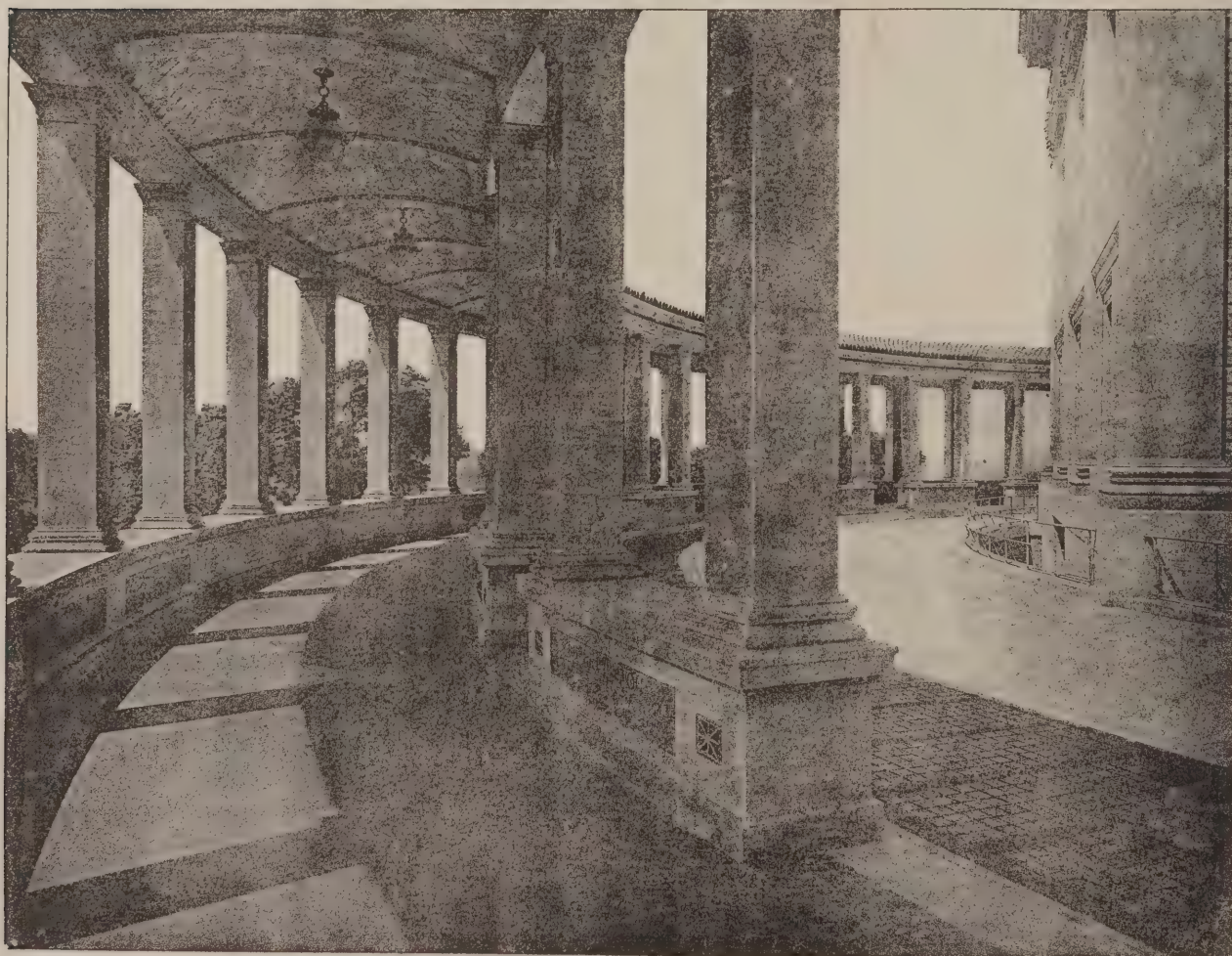
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, March 19th, 1902.



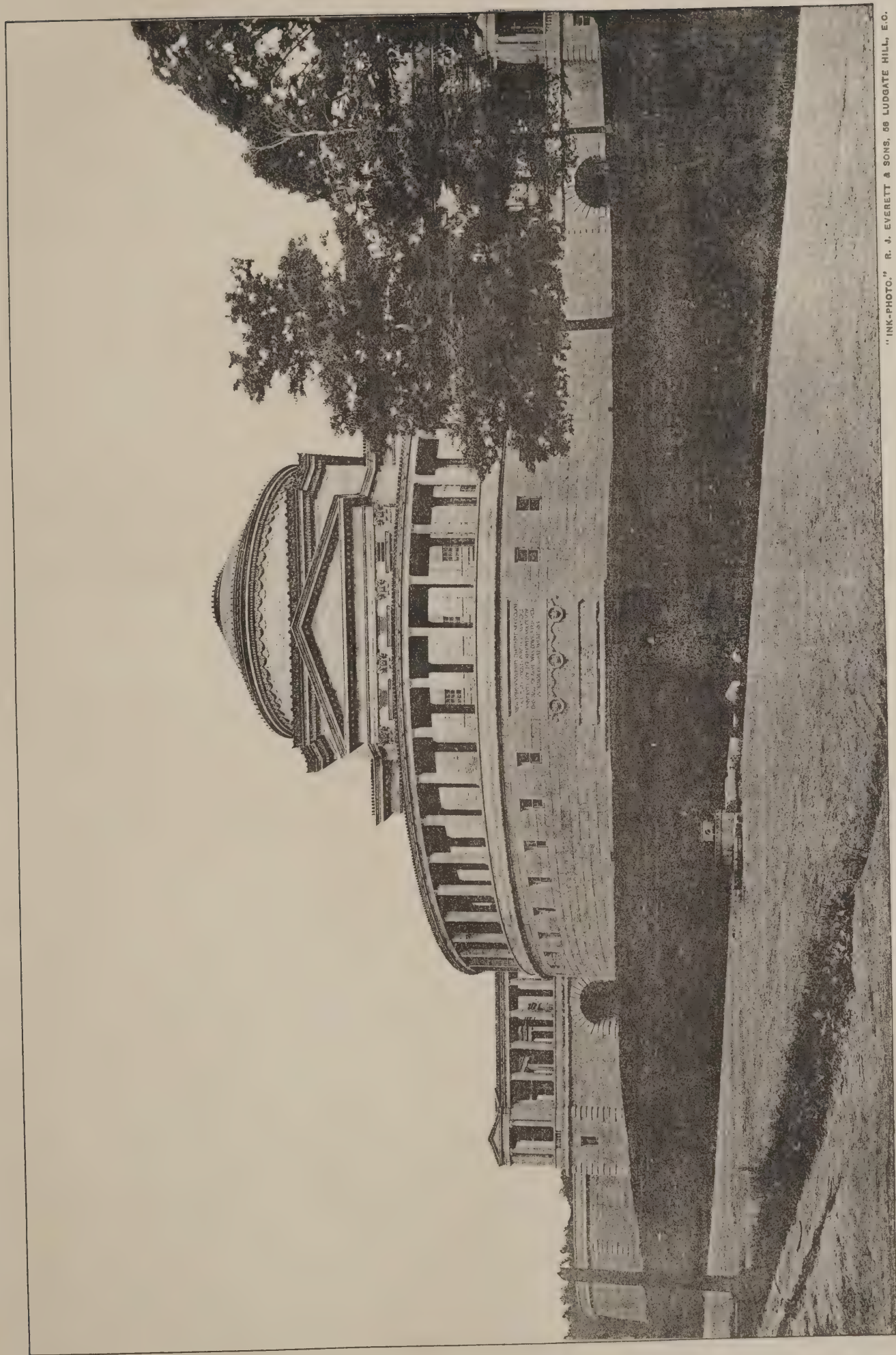
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INTERIOR OF THE PERISTYLE OR TEMPLE OF FAME.
NEW YORK UNIVERSITY. MCKIM, MEAD AND WHITE, Architects.



"INK-PHOTO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

NEW YORK UNIVERSITY: WEST VIEW OF THE PERISTYLE AND LIBRARY. McKIM, MEAD AND WHITE, Architects.

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Photos: Henry Irving.

HOUSE AT FOUR OAKS, SUTTON COLDFIELD, NEAR BIRMINGHAM.
Professor W. R. LETHABY, Architect.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

It is the test of Gothic sublimity to overpower the ridiculous without designing to hide it.

NATHANIEL HAWTHORNE.

Our Plates.

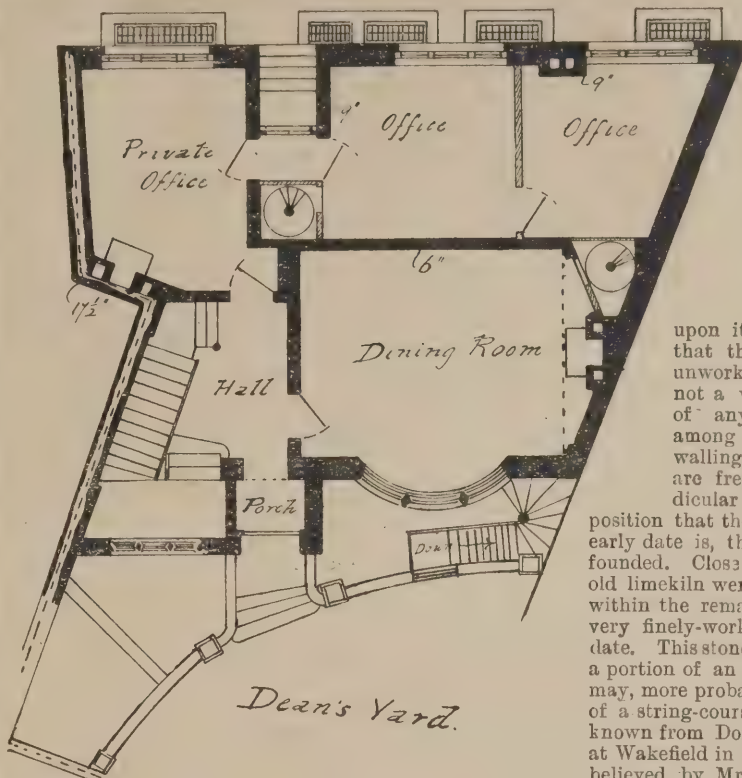
THE house at Sutton Coldfield was erected for Mr. C. E. Mathews from the designs of Professor W. R. Lethaby. The exterior is a direct expression of the plan, and has that peculiar interest and dignity which is attainable in no other way. The house is built of thin red Leicester sand-stocks, and roofed with hand-made tiles from Hartshill. The stables are built of common local bricks, but their bad shape and colour are successfully overcome by whitewash. It is interesting to note that, all inventions being open for modern use, Mr. Lethaby uses indiscriminately sash and casement windows in whatever place each kind is most convenient. But he uses no ornament which is not his own. In the inside there is some excellent plaster-work modelled by himself.—Phillimore House, Dean's Yard, Westminster, was erected for Mr. John Troutbeck, coroner for Westminster, and does double duty as a residence and coroner's offices. The residential part is entered from Dean's Yard, and, with the exception of a private door from the principal's office, is quite cut off from the official part. The latter is entered from the back of the house in Great Smith Street. The architect is Mr. George A. Hall, F.R.I.B.A. The building is of red bricks and Box Ground stone, and was built by Messrs. E. P. Bullen & Co., of Croydon, at the cost of about £3,000. There is a half-basement containing kitchen, servants' hall, pantry and usual offices; ground floor with dining-room overlooking Dean's Yard, and panelled hall; a staircase with panelled and carved oak newel posts; large drawing-room with moulded ceiling and parquet floor; boudoir and two bedroom floors above. The offices consist of:—In basement: Officers' room, approached from the general office by an iron spiral staircase. Coroner's private office. General and clerks' offices and typist room on the first floor, also approached by an iron spiral staircase.

Restoring the Castle of Chillon.

DURING the past few years the famous Castle of Chillon on the Lake of Geneva has been restored considerably. The wall and ceiling paintings in the Hall of Justice and Torture Chamber have been reconstituted. The Chamber of the Duke of Savoy still keeps good traces of its mural paintings and decorated ceiling; and these have only been cleaned, not retouched at all. In one of the courts excavations have disclosed the bases of columns which must have supported thirteenth-century vaulting of a massive type. The intention of the authorities is to make the castle a historical museum; and already some exceptionally good carved wood furniture of the fifteenth to the seventeenth centuries is deposited there.

Building a Lighthouse.

THE NEW LIGHTHOUSE which is now being erected at Beachy Head is intended to replace the house at Belle Tout. The new lighthouse is situated a mile and a quarter eastward of the existing lighthouse, on the highest portion of the sea-bed in this locality, and about 150yds. from the base of the cliff, which at this point is about 450ft. in height. The tide at this spot rises to a height of about 16ft. The base of the new building is 47ft. in diameter, and is built solid for about 47ft. upwards, with the exception of the space required for storage of water. The height to the top of the masonry is about 124ft. The whole of the stonework has been prepared and fitted at the quarries and sent by rail to Eastbourne. Thence by team and traction power it has been drawn to the works at the top of the cliff immediately above the new building, and then conveyed by means of the rope trolley-way to the works below. The cables over which the trolleys run are about 6in. in diameter and are capable of withstanding a strain of 120 tons, but the working strain never exceeds 30 tons. Some of the blocks of stone,



PHILLIMORE HOUSE, DEAN'S YARD, WESTMINSTER: GROUND PLAN. G. A. HALL, F.R.I.B.A., ARCHITECT.

which are of grey granite, weigh about 4 tons. Travelling over the cables to the stage below, they are then, by means of the cranes at the top of the tower, placed in position. The work was commenced in July, 1899. The excavations for the foundations, which are sunk deep in the chalk, could only be carried on while the tide was down. Blasting was not allowed owing to the danger of loosening the surrounding chalk bed and destroying its natural solidity. The structure has now reached the height for the lantern.

A Glamorgan-shire Church.

THE parish church of St. Bride's-super-Ely has been reopened after extensive restoration. The church has a splendid specimen of Norman work in its south porch, removed there from Margam Abbey fifty-five years ago. There is also a beautiful little niche, belonging to the fourteenth century, above the altar, but this probably formed part of a monastic building in the near neighbourhood. The chancel arch is a replica of the original Norman work, but unfortunately no traces of the original intention have been left to tell their own tale, a fact which applies also to the scale-work above the south door. It has a fourteenth-century saddle-back tower, tower arch and quaint old monuments. The east window was brought from St. Mary (Llanfair). The present work of restoration of the church includes the reparation of the tower, the addition of a vestry, wood-block flooring, re-seating the nave, heating apparatus, and generally putting the whole fabric into a thorough state of repair. The contractors who carried out the work were Messrs. Harries & Davies, the architect being Mr. G. E. Halliday, F.R.I.B.A., of Cardiff, the diocesan surveyor.

Discoveries at Wakefield Cathedral.

SOME interesting discoveries have been made during the past few days in the course of the erection of the extensions at the east end of Wakefield Cathedral. Besides making an extension of the existing chancel, and adding a Lady Chapel still further to the east, vestries and a chapter-house are being constructed below the level of the churchyard, completing the corridor, which gives access to the chapter-house from the church and the churchyard. A large amount of earth which was untouched by the preliminary excavations was removed from about the foundations of the remains of the east end. Here some walling,

which may have been the foundation of an earlier church on the same site, was discovered. The wall is of the roughest kind, with wide joints between the stones. Its face, which can be traced for about 3yds., follows an entirely different line from the perpendicular wall which partly stands upon it, and it is noticeable that the stones are entirely unworked, and that there is not a vestige of the remains of any destroyed building among the stones of this lower walling, while such remains are frequent in the perpendicular wall above. The supposition that the rough wall is of very early date is, therefore, probably well-founded. Close by, the remains of an old limekiln were found, and actually within the remains of this kiln was a very finely-worked stone of Norman date. This stone may either have been a portion of an abacus of a column, or may, more probably, have formed part of a string-course. There was, it is known from Domesday Book, a church at Wakefield in Saxon times, and it is believed by Mr. J. T. Micklethwaite, F.S.A., from evidences found in Sir Gilbert Scott's restorations, that it was rebuilt more or less completely "some time in the half-century of which the year 1100 is the middle." This stone is clearly of that date and confirms Mr. Micklethwaite's supposition.

Liverpool Cathedral: Petition Dropped.

IN a letter to the "Times," Mr. T. Myddelton Shallcross, hon. secretary *pro tem.* of the Liverpool Cathedral Petition Committee, says that as the object for which the Committee was formed has been attained through the discussion of the cathedral project which has taken place in the Press, it is not considered necessary to proceed further with a petition to Parliament. In the opinion of the Petition Committee it has been amply demonstrated that the present scheme for a cathedral in Liverpool is not the best possible one under the circumstances; "and this opinion having evidently received endorsement by the public generally, as evinced by the practical cessation of subscriptions to the cathedral fund since the Petition Committee put forward the facts of the matter, there is no great likelihood of a better fate for the Liverpool Cathedral Bill of 1902 (if sanctioned by Parliament) than befell that of 1885."

The New Cathedral at Westminster.

WITH regard to the future of the cathedral "The Tablet" says: "Every effort will be made to carry everything to completion along the lines which Mr. Bentley had planned. Fortunately he has left drawings and designs and colour schemes for the decoration of the cathedral in a very forward state of preparation, and it is not anticipated that those who were accustomed to work with him and for him, and had become familiar with his mind and knew the tradition of his office, will find any insuperable difficulty in giving complete expression to his idea. One thing, at any rate, is quite certain. It is Cardinal Vaughan's hope and wish that the whole of the great fabric shall bear upon it the impress of the mind which designed it. Mr. Bentley lived with the cathedral and for the cathedral, and he lived long enough to leave behind him plans for the decorative treatment of the building, which it is hoped may still be carried out in their entirety."

A New Post-Office at Ferryhill, Co. Durham, is to be erected. It will include a residence for the postmaster. The architects are Messrs. Plummer & Burrell, Grey Street, Newcastle, and the contractor is Mr. J. W. Lazenby, of Ferryhill.

R. I. B. A.

PLANNING OF AMERICAN LIBRARIES.

A MEETING of the Royal Institute of British Architects was held last Monday, Mr. William Emerson presiding. The decease of Sir Richard Temple, Honorary Fellow, Mr. George Frederick Judge, Fellow, and Mr. Walter G. Doolin, Fellow, was announced. Mr. Emerson then announced that the King had decided that the Royal Gold Medal should not be given to the family of the late Mr. J. F. Bentley, as it would create a somewhat objectionable precedent. The Council would therefore have to consider the names of other gentlemen for the selection of the Royal Gold Medallist for the year.

Mr. Sidney K. Greenslade, A.R.I.B.A., then read a paper on "The Planning of Some Recent Library Buildings in the United States," of which the following is a summary:—

The development of the library movement in America during the last ten years had been so enormous that few buildings erected previous to 1885 would be found to-day suitable for modern requirements. The librarians themselves have settled points in the policy of the working of libraries which previously were undetermined, and it was the very active interest of these men which had so greatly assisted the architects to produce such very fine plans. Mr. Carnegie's generosity had helped forward the movement wonderfully. Last year alone he gave more than £2,500,000 for new buildings. The result was that the American architect had unequalled opportunities, and was showing the greatest interest in his work. At present some of the recent plans seemed as perfect as possible, yet the interest in the subject was so great that new developments were sure to take place.

The author went on to treat of various representative libraries under the following heads: (1) Reference Libraries; (2) University Libraries; (3) Town Libraries (in three divisions); (4) Branch Libraries; (5) Small Libraries.

In the first group was placed the Library of Congress at Washington, by far the largest library building in the States, being 470ft. long by 340ft. wide, with four great inner courts. The site was acquired in April, 1886, and Messrs. Smithey & Pelz's plans were adopted, but no limit of cost was fixed. By the summer of 1888 Congress, dissatisfied with progress made, lodged the entire control of the work, including preparation of new plans, in the hands of General Casey, Chief of Engineers of the United States Army, to be erected at a total cost of £1,300,000. It was finally completed in 1897.

The design for the New York Public Library, now being erected, is the result of two competitions held in 1896 and 1897. In the limited second competition twelve firms of architects were selected from those competing in the preliminary open competition, out of a total of eighty-eight. Tentative sketches of the plans of each floor were issued with the instructions. The assessors (with those elected by the competing architects)—Professor Ware, of Columbia University; Dr. Billings, the librarian; and Mr. Bernard R. Green, of the Congressional Library—finally selected a design which practically adopted the whole of these suggestions. The site allows of an isolated building with ample space for future extension, 455ft. frontage and 482ft. to the sides. The cost was not to exceed £340,000 without fittings, but it is estimated now to come to £660,000. The library will have shelving capacity for 2,000,000 volumes, and seems nearly as perfect a library as possible. Messrs. Carrère & Hastings, of New York, are the architects. The State Historical Library building at Madison, Wis., is an extremely well-planned building, and forms an ideal reference library. It is to house 675,000 volumes (architects, Messrs. Ferry & Clas, Milwaukee).

Of University libraries, those of Columbia and New York are particularly worthy of attention. They are not unlike in plan, both in general outline taking the form of a Greek cross. The great central reading-room—in one case octagonal and in the other circular—is the motive of the design in both buildings. Special study-

rooms, with their books stacked around them or near them, are an important feature of both libraries, and in each are treated in a different way. The Columbia University Library is, perhaps, the most monumental of those yet erected in the States, with its magnificent domed reading-room, placed at the intersection of the arms of the cross, octagonal in form, the four sides at the angles being shorter than the others; it is evident that to obtain architectural effect utilitarian points have been somewhat sacrificed, particularly in the storage of books and the difficulty the staff has in handling them. Its total shelving capacity is 1,050,000 books; the cost was £240,000 (architects, Messrs. McKim, Meade & White, of New York). The library of the University of New York (also by Messrs. McKim, Meade & White), though much smaller than the Columbia University Library, is in some ways more compact in plan. Its domed reading-room is circular on plan, and the books are stacked round about it and not below, and are generally more accessible.

The library of the Law School at the University of Pennsylvania had a remarkably well-arranged and convenient plan. The architects were Messrs. Cope & Stewardson, of Philadelphia.

Town libraries the author dealt with in three divisions—under Division I., Large Town Libraries, being grouped the Boston Library, Newark Public Library, Providence Public Library and Washington Public Library. In each of these buildings the motive of the design has been a different one. They all, however, evidence the growth of the free access policy and its great effect upon the plan. Not only is it necessary for the general reading-room to have, as in the Bates Hall at Boston, the walls shelved for books of reference, but the borrower must also be allowed shelves to select from. The excellent plan is adopted at Newark of placing open shelf-rooms on either side of the delivery hall, where thousands of books may be stacked. At Providence the shelves are placed between the entrance hall and the delivery space—not so good a method; still, the floor area at this point is so ample that the whole could be rearranged with advantage. In Newark the stack-rooms are nearly isolated—a great advantage should here occur in the main building. The Boston Library (Messrs. McKim, Meade & White, architects), one of the first great monumental libraries (begun in 1888), was opened in 1895. The building cost £473,000; its present shelving capacity is for 750,000 volumes. The Public Library at Newark (designed by Messrs. Rankin & Kellogg, Philadelphia) was only completed and opened in March, 1901. A great point has been made of "free access" to the books, both outside and inside the stack. There are some excellent points in the planning of the building. The arrangements for the open shelf rooms, delivery hall, work delivery space and stack-rooms are very good indeed, and the approach to these rooms from the main entrance is very direct. The cost of the building was £60,000. The Public Library building, Providence (designed by Messrs. Stone, Carpenter & Wilson), was completed and opened in March, 1900. A serious attempt has been made to meet the new requirements of the "free access" policy, and to a large extent it has been successful. The cost of the building was about £53,000, and the shelving capacity is for 225,000 volumes. The design for the Washington Public Library building was the result of an open competition. Ten well-known library architects were invited to compete, each receiving an honorarium of £50. Other architects were also allowed to send in schemes, and the result was that the plans of Messrs. Ackerman & Ross, of New York, were selected (not an invited firm). The cost was limited to £50,000, but this was overstepped considerably, the total estimated cost being £70,000. Building operations were commenced in August, 1900.

The following town libraries were treated in Division II.—The Carnegie Library, Atlanta, Georgia (architects, Messrs. Ackerman & Ross, New York); the Carnegie Library, Davenport, Iowa (architect, Mr. W. A. C. Jackson, New York); the Pawtucket Library (architects, Messrs. Cram, Goodhue & Fergusson, Boston); and the Public Library, Fall River, Mass. (architects, Messrs. Cram, Wentworth, & Goodhue, Boston).

At least two distinct types of town libraries occur in the libraries illustrated in Division II. The Atlanta and Davenport represent one and the Pawtucket the other. The latter has only a basement and first floor; the others have an additional floor. The open shelf-rooms adjoining the stack-room and either side of the delivery space are an excellent feature in the Atlanta library. The Utica library has not been erected yet. It seems to come midway between the above types. All the important rooms are placed on the first floor. Among points worthy of note are the position of reference spaces (10ft. wide) on each floor of the stack-room; the important position of the children's-room, which balances the general reading-room; and the provision for special study-rooms. The average cost of libraries of this size is £20,000 to £50,000.

The author next discussed the third division of town libraries. The effect of the "free access" policy is well illustrated in the three libraries selected as examples, viz., the Carnegie Library, East Orange (architects, Messrs. Jardyne, Kent & Jardyne, New York); the library at Duluth, Min. (architect, Mr. A. Rudolf); and the Public Library, Tacoma, Washington. The tendency to do away with walls and substitute columns with glazed screens between is a feature in all of them. In the East Orange and the Tacoma libraries the use of the radiating stack is new for a large building.

The system of branch libraries and stations is remarkably organised in many of the large towns. Mr. Andrew Carnegie has given £1,000,000 to build sixty-five new branch libraries in New York, and the Board of Library Trustees have just appointed three firms—viz., Messrs. McKim, Meade & White, Messrs. Carrère & Hastings, and Messrs. Babb, Cook & Willard—to take the entire charge of the designing and supervising of these buildings. These firms will confer and collaborate in the work.

Up to the present time the planning of the branch library has been studied, perhaps, in Pittsburg more successfully than in any other town in America. There are five branches already erected of the seven presented by Mr. Carnegie, each on an isolated site (architects, Messrs. Alden & Harlow). The growth of what may be called the "turnstile control," resulting in the abandonment of the entrances to the reading-rooms from the delivery hall, as adopted on the first plan, is important. The apparent unfitness of the low railing separating the reading-room from the delivery hall, as adopted in the West End branch, and substituted afterwards by screens in the later plans, is also worthy of note. Although the radial-stack plan is costly to build, yet the advantages where a "free access" policy is adopted are very great.

The requirements of small libraries have been particularly well studied in the State of Massachusetts. Hardly a village or hamlet is without one. The author selected for description the little library at Wayland, Mass. (architects Messrs. Cabott, Everett & Mead, Boston); the Russell Library, Plymouth, Mass., by the same architects; and the library at Weston, extremely convenient and well-arranged for its purpose (architect, Mr. Jenny, Boston).

Professor Beresford Pite proposed a vote of thanks to the reader of the paper. Mr. Quinn, librarian, said he was struck with the way in which the American architects had made everything subservient to economy of administration, which was perhaps more an essential in this country than in the United States. The reason the important rooms were placed on the first floor was chiefly that it had been found that tramps and loafers were adverse to going beyond the ground floor, and another advantage was that quietness was best assured there. In this country the penny rate was a very serious drawback to good public libraries.

Mr. Osmond Smith seconded the vote, and Mr. William Emerson also spoke.

Mr. Greenslade in reply said the children's rooms, though so large, were generally filled, and school books were provided in them and children came and prepared their lessons. Special rooms were also provided for teachers who brought classes there. It was surprising how the libraries though so large were filled with books of a most extensive and practical range.

STRUCTURAL COLOUR DECORATION IN PUBLIC BUILDINGS.*

By GERALD C. HORSLEY.

THE subject which we are now to discuss may, I think, be said to embrace those many systems of decoration which by their nature are one with a building or an actual part of it. It does not include those likewise numerous forms of decoration which are easily removed from the building they are intended to adorn. For instance, the Pallazzo Pubblico at Siena, with its large frescoes, comes within our view, but the great council hall at Venice, on the walls of which are stretched the largest canvases in the world, including the Paradise of Tintoret, however much we may admire them, does not.

We may consider our subject in two parts or divisions:—(1) Those buildings whose actual materials form a colour scheme, such as the Duomo at Siena. (2) Those buildings which have been so decorated that the colour is made one with the materials of the building, such as S. Francesco at Assisi or the Borgia apartments in the Vatican. But, of course, these two kinds of decoration overlap and react upon one another.

English Decoration; the Succeeding Foreigners.

Unfortunately there are but few public buildings in this country which have any structural colour decoration, there being little demand from the public for works of the kind. It is a remarkable fact that since the sixteenth century in England the practice of decorating in colour all our buildings, both public and private, as a natural and expected action, has declined. The late Professor Middleton has said of English art from 1260 to 1320:—

"The painting of England was unequalled by that of any other country; even in Italy, Cimabue and his associates were still labouring in the fetters of Byzantine conventionalism, and produced no works which for jewel-like colour and grace of form were quite equal to the painting under Edward the First."

Encouraged by kings such as Henry III., and by the Church, English artists decorated Canterbury, Westminster, Salisbury and countless buildings throughout the land, but the coming of the Renaissance from abroad, the fall of the Church and the growth of Puritan feeling seemed to paralyse the development of native decorative art. Moreover, little belief in our powers was shown by those in high places, by those able to commission and encourage. Was sculpture needed, or painting, the artists must come from abroad. Torregiano must make the king's tomb, later Rubens alone can paint the roof at Whitehall, just as Vandike must paint the portraits, Verrio must paint the ceilings and walls at Hampton Court. Though, through it all, there were English painters, whose works we know, and many art craftsmen, the English artist was eclipsed by the superior skill of the foreigner. With the advent of Wren, the great English master, we find our countrymen again employed in important work, Streater in the Sheldonian at Oxford, and, still later, Sir James Thornhill at St. Paul's and at Greenwich.

It has been said that the revival of letters 400 years ago made it no longer so necessary that the walls of public buildings should furnish a literature for the people, and thus a great incentive to noble, historical and allegorical painting died. Together with the sciences, the painters became learned and conscious. Architecture thought more of itself and less of the other arts which had previously combined with it to form an organic whole. If she used painting, it was more as a mistress employs a handmaid, and less as an equal co-operating with an equal, and painting apparently would have it so. Instead of covering wall surfaces with representations of noble deeds by great men or pictures portraying the mightiness of virtue and the baseness of evil, as in the days of Giotto and Lorenzetti, she wasted her powers in extravagant flatteries of her employers, such scenes as we see Rubens painted for Marie de Medicis, the Apotheosis of James at Whitehall,

and the foolish scene of Olympus, by Verrio, at Hampton Court.

We cannot imagine a more half-hearted, or more selfish condition of things, or one more contrary to the spirit of the great days of art. It is at any rate to the credit of English architects that they have all along recognised—and with much fulness of late—the harmfulness of the position.

On the other hand, we have also to notice that the Continent has never lost in the same degree as ourselves its interest or delight in the use of colour decoration. In Italy to this day a colour scheme in a new building has a prominent place. In France a church, a mairie, or a theatre, even a railway station,* is not considered complete until it is painted in tempera or with canvases, *marouflé*, so that they form part of the building. Such conditions as these may also be found in Germany and Austria. England alone seems with but few exceptions to disregard colour as a necessary element of beauty in the designs of the interior of her public buildings.

Butterfield and Street.

But it is time to discuss the two divisions I have mentioned. First, those buildings whose actual materials form a colour scheme. This is a method of decoration which was more in favour with the last generation of art workers than it is with us at the present day. We are reminded of the buildings of the "Gothic revival," of the works of Butterfield and Street. These buildings were the result, no doubt, of visits to Italy, where their prototypes may be found, also of a study of our own Gothic period, when a certain amount of parti-coloured wall work was done, brought to us by the mediæval current of art practice from east to west. Modern churches like All Saints', Margaret Street, and Keble College Chapel, by Butterfield, and the church in Garden Street, Vauxhall, by Street, are buildings of this type. We must remember that when Butterfield did this work it was a great achievement, a deliberate attempt at a human expression in art, and a clean break-away from the (to him) cold and formal, dull and vacuous interiors of 1845. In "All Saints'" he has done this, his first essay in the manner, with consummate skill and largeness of feeling, better than at any later time and better than any of his imitators, and there were many who followed his lead. Few artists ever took such great pains or had such great gifts as William Butterfield. We must not think that he introduced this coloured work with the sole intention of breaking up the appearance of the wall surface. This was clearly not his main idea. With the "true principles" of the neo-Gothic architect—and here I think we have the principle underlying so much of this work—his aim was to get a permanent wall decoration, one which would outlast the usually improperly-made plaster wall-covering. He recognised the difficulty and expense of securing any form of painted wall decoration, also the deleterious effects upon any painted surface of the fumes from gas lights and oil lamps, and the lively-charged atmosphere of London and our great cities. He set himself, therefore, to produce something suitable, lasting and easily kept clean. He did this admirably.

The Schemes in All Saints', Margaret Street, and at Keble College.

In All Saints', Margaret Street. First there is a tile dado of full colour about 5ft. high, above large scenes from the New Testament painted on tiles. Above the arches of the nave arcade the wall-surface is stone inlaid with bold patterning in tiles and dark inlay. On the east wall only is there any painting. Here are frescoes by Dyce in panels spaced between margins of alabaster. The roofs are vaulted and painted in the chancel, and there is painted wood in the nave. With the exception of the pictures on the east wall there is not a scrap of plaster in the church, and no one will deny that the scheme is interesting and good. In Keble Chapel there is a very similar scheme, but in materials more precious, as befits a college chapel of such importance. Here the lower part of the wall has an arcading of stone, with the spandrels formed of coloured bricks. Above a

height of about 10ft. from the floor are pictures in mosaic framed in stone. The pictures form a large and striking frieze running round the chapel; above are the windows filled with painted glass. Between and above these are more bands of coloured brick. The roof is vaulted, painted to represent stone. Here again, therefore, except in the painted roof, the ground of which I suspect is in well-made plaster, there is no plaster used, and the whole effect is one of great dignity. To our eyes nowadays such a method as this would require to be carried out on the broadest and simplest lines; we should also demand that the materials should be worthy. The black, white and yellow bricks of fifty years ago have few charms for us now.

The system of alterations of colour in a wall-surface fits in with the natural demand of the eye, which welcomes and recognises the propriety of variety in colour. It is open to us, therefore, to appropriately use the differently coloured stones we have or our own native marble, while, thanks to the discovery and re-opening of some of the old Greek and African marble quarries by men of energy and foresight like Mr. Samuel Brindley, of Messrs. Farmer & Brindley, ancient sources of supply are no longer closed to us. So long as we arrange the materials at our hand, be they of clay or stone, with breadth and simplicity, we shall be treating them with the dignity they deserve; and in buildings of importance we shall, I think, be treating ourselves with greater consideration if we invest our patterns with some meaning and intention. In passing I may point to the Baptistry of Florence, San Miniato at Florence, some late Roman examples at Ravenna, as being particularly successful examples of the use of marble in this connection. The cathedrals of Orvieto and Siena are direct descendants of the striped work of the Saracen builders, a method of building common in the East to this day and dating from her immemorial history.

The Houses of Parliament.

The second division of our subject—"those buildings which have been so decorated that the colour is made one with the materials of the building"—offers a larger field for examination. Who can read the story of the preparations for decorating the Houses of Parliament fifty or sixty years ago without amazement and astonishment at the ignorance of and want of confidence in the capability of the painters of that time by those in high authority. For about twenty years a Royal Commission was in existence to consider and decide upon the best means of painting certain panels and rooms in the new Palace of Westminster. They instituted open competitions, invited cartoons, called for samples of painting in fresco. They doled out a few commissions. The expense incurred in preparing for these competitions and trials in painting must have brought many artists to the verge of ruin, and the many delays and slow procedure disheartened and crushed the spirit of all. If anyone wishes to read the sad story of these years let me refer him to Redgrave's "Century of Painters," where the whole history is set forth by one who lived during the time and knew it well. It may be that the Government of our country is too complex and vast an institution to see and use the advantage of departing from the competition system and to trust with commissions artists whose works and capabilities are known. The few examples of such a departure we have had have been signal successes. I may refer, as an instance, to the employment of the late Lord Leighton in the frescoes "Arts of War" and "Arts of Peace" at the South Kensington Museum.

Decorative Work in the Provinces.

Fortunately, the experience of the working of the Houses of Parliament Commission I have referred to has served as a warning throughout the country to municipalities and to individuals, and no doubt it has been easier for municipal councils to foster and encourage the arts of the country, with their less cumbersome governing machinery, and to avoid the many mistakes it is possible to make in the fit decoration of a building of importance. Manchester is most fortunate in having commissioned Ford Madox Brown to paint the scene from her history in panels in her Town Hall. Glasgow is employing some of her own sons, Messrs. Henry, Lavery,

* A paper read before the Society of Arts on March 4th, 1902.

* The new Gare D'Orleans, at Paris, which has two large wall paintings of "Biarritz" and "The Loire" in the waiting hall, by Cormon, membre de l'Institut.

Walton and Roche, in her city buildings. The Corporation of Liverpool, acting wisely on the advice of their architect, have commissioned Mr. Charles Furse to paint the pendentives of their large dome, illustrating scenes from the commercial greatness of their town. Birmingham has commissioned some of the students of her Municipal School of Art to paint scenes of history in panels in the Town Hall. The Corporation of Colchester also, in the new Town Hall, on the advice of their architect, Mr. Belcher, is employing the master of her art school to decorate the council-chamber and Moot hall, under his supervision and with his assistance. In London, in our own Royal Exchange, the Corporation of the City of London, together with some of the great City companies, have commissioned artists to paint the panels of the ambulatory.

For some years past the municipalities of our towns have been fostering a love and appreciation for our arts by buying pictures and placing them in suitable galleries. This virtue of acquiring beautiful things has now been supplemented by the further step forward in giving commissions for mural painting. In the placing of these commissions we have the greatest hope and encouragement for the future, and with the increase of the municipal councils which is taking place in our midst we may look to see full advantage taken of the opportunities the public buildings present for the employment of artists of proved power and attainment, to the advantage of the people of this country. With this hope in our hearts, we may consider with greater interest certain of the methods of works which at the present time are in use.

Marble, Mosaic, Plaster, Stucco, Sgraffito.

Before speaking of different forms of painting available I would like briefly to touch upon the possibilities offered to us by the use of marble, mosaic and plaster, stucco duro and sgraffito. These are so closely allied to the first division of the subject that I would speak of them here. We know that the Egyptians, Greeks and Romans used colour largely in their buildings, but we can have but little idea of the magnificent effects often attained by means of their fresco painting, encaustic painting, tempera, modelled plaster, mosaic, marble linings and veneering, bronze, ivory, gold and silver overlaying and inlaying.

For instance, we read of the Golden House of Nero that the walls were encrusted with gems and mother-of-pearl, of banqueting-halls having ivory ceilings; of a ceiling in the State dining-room which was spherical in shape and cut in ivory to represent the constellated skies, and kept in constant motion by machinery in imitation of the stars and planets. This magnificence, inventive and symbolic, partook something of the marvellous and the rare qualities which we have far to seek in this prosaic age. Of their large halls, basilicas or baths it was also a custom of the Romans to line the walls with marble slabs to a considerable height, and above to use mosaic or plaster reliefs. The vaulted ceilings were generally coffered, and decorated in plaster reliefs, coloured and gilt; bronze rosettes were also used in the coffers.

This was a general form of decoration throughout the Roman Empire both in the West and East. We find it used by the Byzantine builders, in Constantinople, Sicily and Italy, and we may be of opinion that few finer schemes of decoration than this have ever been devised. In some manner adapted to our modern needs, it is available to-day, and it is understood that the principle is to be adopted in the new Roman Catholic Cathedral at Westminster.

Modern Mosaic.

In considering the use of mosaic at the present time we may hope that the modern and vicious habit of preparing mosaic tesserae face downwards on a sheet of paper laid on a flat table and then pressing the sheet of paper into position has been finally given up. Forsaking the old and only right method of fixing each tessera into the cement pushed in by hand from the front, too many works of the last century are deficient in one of the most important elements of decoration, namely, the right technique. Sir William Richmond has shown in the work which he has done that there is no more trouble and no appreciable loss of time

in doing mosaic work in the only true way, namely, pushing it in tessera by tessera from the front. His assistants after very little practice have been able to do the work on these lines with the greatest rapidity, and naturally with intelligence and interest in seeing their work in position as it proceeds.

Time will not permit me to speak of modelled plaster and sgraffito in any detail, except to express the satisfaction we must all feel that these ancient arts of tried quality are understood and worked in a modern spirit to-day. The composition of

Stucco Duro

has been often described, and we know by the remains of ancient Roman work found in the Villa Farnesina, and of the works of the sixteenth century in the Loggia of the Vatican, and the Villa Madama, and other buildings in Italy and France, what exquisite possibilities this material presents. The work, particularly in the early Renaissance, was usually decorated in colour. This was generally laid on whilst the stucco was wet, as in fresco, and the details heightened with tempera or encaustic colours, and accessories enriched in gilt gesso.

We may congratulate ourselves that artists like Mr. George Frampton and Mr. Anning Bell have worked in this material in churches and other buildings in our time. The processes of stucco duro and sgraffito are fully described in the "Arts and Crafts Essays" published in 1893, the former by the late Mr. G. T. Robinson, and the latter by Mr. Heywood Sumner, whose work in All Saints' Church, Ennismore Gardens, affords an example of modern treatment. I need not do more than name these two forms of lasting decoration, peculiarly structural and available to us to-day.

Buon or True Fresco :

And now as to the principal methods in use by painters at the present time. Probably the world has never seen a more beautiful method of painting than Buon or true fresco, but, alas, its use has not been fully justified in this country. The Royal Commission I have just referred to took a good deal of evidence as to its suitability for the decoration of the Houses of Parliament. A number of painters of eminence spoke against its being attempted. They advocated the use of oil colour. But the Commissioners, perhaps dazzled by what were then considered the triumphs of modern art, the frescoes at Munich, decided that the new paintings should be in that method.

Dyce, Cope, my father, and one or two others, were successively commissioned. Exposed, however, to the bad air of their surroundings, these works have in some cases suffered beyond repair. So doubtful were the painters themselves as to the suitability of the scheme that when Maclise was commissioned to paint the walls of the Painted Chamber he, with the sanction of the Commissioners, proceeded to Germany in order to make researches into the practice of stercochrome or water-glass painting. The result was that he adopted the process in the large wall painting "The Meeting of Wellington and Blucher after the Battle of Waterloo"; it was also adopted by Mr. Herbert, who was then engaged on other wall-surfaces in the palace.

Its Composition.

You will permit me to remind you of what happens in Buon fresco. The powder colours mixed with lime-water are applied to the last and freshly-spread coat of plaster before it has had time to absorb more than a trace of carbonic acid from the air. The painting ground is in fact saturated with an aqueous solution of hydrate of lime, that is, slaked lime, while there remains a large reserve of this compound in an undissolved condition. When on such a surface a layer of pigment mixed with water is placed, as that water evaporates the lime-water in the ground diffuses into the paint, soaks it through and through, and gradually takes up carbonic acid from the air, thus producing carbonate of lime which is the actual binding material.* The whole painting gains in this chemical action, appearing to absorb light and to reflect it on the sand facets of the ground to the spectator.

But, unfortunately, and here I again quote

* I am indebted to Professor Church's "The Chemistry of Paints and Painting" for this description.

from Professor Church's interesting book, "the protection afforded to the pigments by the binding material, this carbonate of lime, is not generally very efficient. In the case of a dry wall, free from soluble saline matter, and exposed to a pure atmosphere, it may remain good for centuries. But in air contaminated with the products of the combustion of coal and gas, and with tarry and sooty impurities, a fresco picture soon perishes. The binding carbonate of lime is converted into the sulphate, breaking up the paint. The same causes will form sulphate of magnesia from the carbonate of magnesia in the plaster, and the paint will scale off."

In our large towns therefore to-day Buon fresco has no chance of lasting.

The Stereochrome or Water-Glass Process

consists in spraying the painting after completion with a warm dilute solution of potash silicate, or potash-soda silicate, which is obtained by fusing the purest sand obtainable with carbonate of potash or carbonate of soda. The pigments themselves are mixed with some of the fixing liquid. This form of painting is a German invention of comparatively recent date; it has not been frequently used in this country, and we have very little experience of its behaviour.

Tempera Painting.

In the consideration of the possibilities of tempera painting we find ourselves on surer ground, no longer so fearful of the consequences of the contaminated atmosphere of our towns. I am glad to be able to read you a few words I have received from Sir William Richmond as to this medium which he used on the walls of a modern church at Cheltenham a few years ago. He says:—

"The wall was prepared with lime and sand—the final in tonaco was in marble dust and well, slaked lime, and it was wonderfully white. The whole design was drawn in charcoal, corrected with care. Egg, capric wine and powder colours were used. The yoke of egg alone was used, plenty of wine and distilled water. The first painting should be in what the Italians called 'Verdaccio,' namely, raw siena (black and white), with plenty of impasto. In two hours this can be glazed with warm colour and painted into. I am quite certain that the yolk of egg and wine form the very best and most durable medium for wall painting. Most of the Italian wall paintings which have lasted were not painted in fresco, but in the tempera of yoke of egg, the essential oil of which is a most powerful binding liquid, enabling the painting to dry like a rock."

Sir William further says:—

"I prefer yoke of egg and wine, even to Buon fresco, the colour is almost as pure, not quite so light, and if it is necessary to get rich colour the medium will give it to any extent."

Professor Church, speaking of the large amount of oil in the egg yolk, says, "This vehicle does not act so effectively as oil and varnish in locking up pigments, and so the protection against change which it affords is less." But I think we may take it that the protection is certainly considerable, while the old method of varnishing the painting with sandarac in oil affords further protection against moisture and impure air.

Spirit Fresco.

The well-known spirit fresco, invented by the late Mr. Gambier Parry, differs little from ordinary oil painting on account of the large quantity of oil in the copal, which forms so much of the medium, the constituent parts of which, I may remind you, are only multiple of these proportions:—

	Ozs.
Gum elemi or elemi resin	2
Pure white wax (beeswax)	4
Oil of spike lavender	8
Finest preparation of artists' copal	20

With this medium incorporated by heat all colours in dry powder are mixed. It appears that Mr. Gambier Parry gave the name of spirit fresco to the method because oil of spike and turpentine may be freely used as liquids during the process of painting. The beeswax secures, of course, a perfectly matt or dead surface, but it is liable to produce a kind of bloom in the course of years, and may wholly disappear in the course of time.

Besides the paintings by Mr. Gambier Parry

at Higham and Gloucester Cathedral, Lord Leighton's "Arts of War" and "Arts of Peace" at South Kensington, and seven paintings by Ford Madox Brown in the Town Hall of Manchester, are examples of this method. They appear to be standing well, though we may expect them to darken, and there are a few signs of the bloom referred to above in the "Arts of Peace."

Professor Church considers that a sound medium is to be found in the proportions of—

	Ozs.
Oil of spike - - - - -	12
Paraffin wax - - - - -	4
(The two mixed by heat.)	
Copal picture varnish - - - - -	20

He advises the pigments being mixed in brown linseed oil, rather than in the medium itself as PARRY recommends.

Wall Paintings on Canvas.

I have dwelt on the component parts of these wax and oil mediums in some detail, as it is but a step from them to the method which is generally adopted by painters to-day. I refer to the prevalent custom of painting in oil on canvas, and then, on completion of the picture, having it fixed, or *marouflé* as the French call it, to the wall or ceiling; that is to say, the canvas is fixed by means of a thick paste of white lead oil and copal varnish, spread upon the wall and simultaneously upon the back of the canvas.

The French painters in the beginning of the nineteenth century, like their German brethren in Munich, painted mural works in fresco, but they were already beginning to discard the practice when we, in our wisdom, were working in it at Westminster. They also used encaustic painting (Delaroche's Hierarchy in the Ecole des Beaux-Arts is an example), but since 1870 the most important works have been painted on canvas fixed in the way I have described; such are the great wall paintings by Puvis de Chavannes in the Pantheon, Amiens, Rouen, Lyons, The Sorbonne and the Library in Boston. This, too, is the method adopted in the Royal Exchange, at Liverpool, at Glasgow, and by Messrs. Sargent and Abbey in the Library at Boston.

Without going deeply into technicalities which would naturally vary with each painter, the colours used are simply oil colours, with a medium of wax and turpentine. Professor Moira, who has painted in this way at the New Renshaw Street Chapel in Liverpool and at other places, tells me he likes the canvas to be fairly coarse and open, so that there should be no hindrance to the fixing material incorporating itself with the colours laid on. This is better achieved by doing the first painting only in the studio, and completing it *in situ* after it has been fixed upon the wall or ceiling. The painting of the picture *in situ* in this way will I am sure commend itself to all as a most important side of this system of decoration. It is understood that some of the modern works I have named have been painted entirely in the studio; corrected in many cases no doubt when in position. But as a practice it must surely carry with it its own condemnation. Although scale drawings and models may be made with the utmost care, and cartoons in full-size tried in position, all of which should be done and invariably is done before the painting is begun, unless the work or at least the major part is carried out in the building, it is not possible for the painter to be confident as to the correctness of his scale or, what is more important in its difficulty, of his colour. Both these elements, more particularly the last, must surely be influenced by the size and lighting of the building, an intimate knowledge of which is revealed by working in it. Are we to suppose that the ceiling of the Sistine Chapel would have been so magnificent as it is if it had been painted in a studio and then fixed in position? I confess the very thought is sacrilegious, and I tremble at suggesting it.

In this connection I am reminded of a painting on canvas which was painted chiefly on the wall, where by its position in a dark corner of a church certain colours had to be used which are startling in what would be their inappropriateness in a better light. For instance, in order that the hair of the Saviour, one of the figures in the composition, should appear brown, pure



BELLFIELD HALL, ROCHDALE. DRAWN BY W. EATON, A.R.I.B.A.

vermilion had to be used; ordinary light brown appeared black.

But it is unnecessary to multiply instances, and I would venture therefore only to suggest that as in most cases the position of the painting so implies the colour to be used, that it is desirable the painting should as far as possible be painted *in situ*.

It is to be hoped that the convenience of this modern method of wall painting will not deter painters from working directly on the plastered wall in tempera, oil or encaustic. If the beautiful qualities of fresco are denied to this country, there are yet the qualities inseparable from a plaster ground which a canvas surface can never, I think, present quite in the same way.

Design I need not touch upon. There is no excuse for bad work, surrounded as we all are by the highest example. A fine translation of modern life appears to be growing in mural painting of the great type, and is heartily to be welcomed. In this connection I would draw attention to Mr. Furse's work at Liverpool, and some of the work at Glasgow, while in allegory we have the great work of Mr. Sargent at Boston. In setting ourselves a standard we may remember perhaps the words of Puvis de Chavannes: "Toute décoration ne peut être belle que dans la mesure où elle reflète la Nature et en traduit la passion."

Bellfield Hall is near Rochdale and adjoins the ancient village of Newbold. It is one of the very few halls in Lancashire on the quadrangular plan. It was built at various times, but chiefly during the reigns of Henry VIII. and James I. The sketch on this page shows the north-west angle of the quadrangle. The ancient banqueting hall has windows of enormous size, with sixteen lights in the width. A number of the rooms are now divided by brick walls and are used as cottages.

Longstock Parish Church.—A faculty for a rood screen in Longstock Church has been granted. The church was erected in 1880 from the designs of the late Mr. William White, F.S.A. A rood screen was included in Mr. White's original scheme. Messrs. Harry Hems & Sons, of Exeter, are carrying out the work, which will be entirely in Hampshire grown oak. Mr. Harry Hems was for considerably more than thirty years the chief craftsman employed by Mr. White to carry out the artistic portions of his many works at home and abroad, amongst other places at the cathedral upon the island of Madagascar, and all the carved and sculptured work upon the general fabric of this church was executed by him under Mr. White's supervision.

ROBERT ADAM.

AT Leighton House, Kensington, Mr. Percy Fitzgerald lectured last Wednesday on Robert Adam, architect and artist. He said the memory of Adam would be most cherished as architect of the Adelphi, where all the qualities of picturesqueness, homogeneity and dignity were exemplified. The front of the Society of Arts was, for instance, incomparable for the spirit of cheerfulness and animation which entered into the design. Another striking example was Alliance House, which for ornamentation was unique. In fact, remarked Mr. Fitzgerald, no one knew what wonderful architectural genius was displayed in creating the Adelphi—the terrace, the tiers and the underground arrangements—until they investigated it, and it was gratifying to admirers of Adam that his name should be kept green by "Adam Street," and that his brothers should be remembered in the nomenclature of adjoining thoroughfares. Adam's genius asserted itself at a time when the heavy classical style of architecture was in vogue, and although he (Mr. Fitzgerald) did not disguise the fact that there were those who objected to Adam's style, yet it was reassuring to know that it had held its ground for 140 years. Indeed, he was glad to note a sign of the revival of Adam's ideals both in architecture and decorative work. Warrings, Ltd., had, he was glad to say, done a good deal in this direction, and it was appropriate that one of the rooms at the Hotel Cecil, which he believed had been named after Adam, should have been decorated and fitted up entirely on his ideas. Some examples of Adam's work were to be found in Fitzroy and Bedford Squares. Lansdowne House was, in his opinion, one of Adam's triumphs in town residences; and of palaces he knew nothing to compare with that in Osterley Park—a distinguished Jacobean structure in which Adam's ideals had full play. But Adam was not merely an architect of distinction—he was an artist of the first water. His decorative work was characterised by great elegance, his work in iron had certainly never been surpassed for beauty, while his furniture rivalled that of Chippendale. His work in metals was not confined to large objects—he even devoted himself to door-knockers and to the knobs of canes carried by dandies. Mr. Fitzgerald mentioned, as a unique fact, that Lady W. Wynn's house in St. James's Square was not only built by Adam but was decorated by him, and furnished, even to the humble cruet-stand, on his designs.

Westminster Cathedral.—We are officially informed that there is no prospect of the cathedral being opened this year.

Keystones.

A Stained-Glass Window has been placed in St. Paul's Church, Canterbury, to the memory of Sergeant Harold Arthur Gilham.

The Wesleyan Methodist Church at Dorchester is to be enlarged by the addition of a chancel and side galleries at a cost of £3,000.

A New Electricity Station at Nelson has been erected by the Nelson Corporation at a cost of £30,000 from designs and under the superintendence of Mr. Fraser, the borough electrical engineer.

Baptist Church and School, Wellingborough.—The designs submitted by Messrs. George Baines, F.R.I.B.A., & R. Palmer Baines, 5, Clement's Inn, Strand, W.C., have been accepted for these buildings. The accommodation provided in church is for 601 adults. The estimated cost of the complete scheme, including tower, is £4,923.

A New Wesleyan Church at Branksome has been erected at a cost of about £1,600. It is intended to build a school at the rear, at a further outlay of £400. The original designs for the building were provided by Mr. C. Bollam, architect, of London, but they have been altered and amended from time to time as circumstances required. The building provides seating accommodation for 450 persons. It is Gothic in style and is built of local red bricks with white stone dressings. Mr. E. H. Crabb is the contractor.

Hornsea Parish Church, which during the past few years has been enriched by the addition of several costly gifts, was reopened recently after a short interval, during which a chancel screen and several other additions were made to its internal fittings. The screen is so arranged that while the bottom part is open so as not to spoil the view of the east end, the upper part is exceedingly rich in carving. It has been erected from designs by Messrs. Brodrick, Lowther & Co., of Hull and Hornsea, and the work has been carried out by Messrs. W. K. Barr & Sons, of Hornsea.

A New Hotel at South Shields has been erected at the corner of Chichester Road and Stevenson Street. The first storey is of brown and green faience work, supplied by the Burmantofts Fireclay Co. of Leeds, the upper parts being of red bricks, with tiled roof, while the corner is surmounted by an ornamental dome. Messrs. M. Hall & Son, of South Shields, were the architects, and Messrs. R. Summerbell & Son, of Tyne Dock, the contractors. The other contractors were Messrs. Wylie Brothers, for tiling, &c.; W. Allon, painting and decorative work; Fowler & Brock, upholstering and furnishing; and J. Douglas, plumbing and electric lighting.

The Soane Museum, in Lincoln's Inn Fields, is now open to the public for the season. Among the art treasures of the museum are the alabaster sarcophagus of Seti I, who ruled Upper and Lower Egypt about 1380 B.C., and several paintings by Turner. The collection is rich in works by Hogarth. It is open on the Mondays, Tuesdays, Wednesdays, Thursdays and Fridays of every week from March to August. Nothing had been altered since 1837, when Sir John Soane died, and the only modern addition is the electric light. Only one article has been added to the museum since Soane's death, and that is a bracelet left by a lady. At first the trustees declined to receive it, but the judges decided otherwise. The jewel was worth about £2 10s., and the law costs amounted to £92.

Truro Cathedral.—A correspondent of a local paper says: "When my lifelong friend, Mr. Henry Cane, was for some time clerk of works over Truro Cathedral he prophesied darkly the all too early fate of the building. He roundly asserted the late Mr. Pearson had altogether miscalculated the weight and strain which the stone used in the construction would carry, and stated his belief that in less than fifty years the whole edifice would suddenly fall down. Mr. Cane was one of the most trusty of the late Sir G. Gilbert Scott's clerks of works, and under him superintended the erection of some of the most important buildings in the kingdom. He was also for a number of years the resident clerk of works of York Cathedral. He is now resident at North Yamhill, Oregon, U.S.A."

The British Association.—The Council of the British Association have nominated Sir Norman Lockyer, K.C.B., F.R.S., as president at the meeting to be held in Southport in 1903.

Builders' Journals Wanted.—The publisher will be glad to send a copy of the current issue of THE ARCHITECTURAL REVIEW in exchange for a copy of THE BUILDERS' JOURNAL for August 28th, 1901, which is out of print.

Additions to the Victoria Institute at Worcester are to be made. A competition is to be held, confined to local architects and to three students at the Institute—Messrs. A. G. Parker, H. J. Pitcher and W. J. M. Thomason.

The Furniture for "The Princess's Nose," Mr. Henry Arthur Jones's new play produced at the Duke of York's Theatre last week, has been supplied by Messrs. Oetzmann & Co., of Hampstead Road, W.

A Memorial Fountain to Prof. Henry Drummond, designed by Mr. Pittendrigh MacGillivray, has been erected in Glasgow. It is in bronze and forms part of the central pillar of the Park Gate entrance to Kelvingrove Park. The main feature is a medallion portrait of the Professor modelled in low relief.

National Photographic Record Association.—The object of this Association is to collect photographs of any object of interest to the architect or archaeologist, literary or scientific man. The photographs are placed in the Print Room of the British Museum. Whole-plates are preferred, but half-plates, or even quarter-plates, are acceptable. Prints must be by some permanent process, such as platinotype or carbon: bromides and print-outs are not desired. About 2,500 photographs are at present in the collection. The hon. secretary of the Association is Mr. G. Scamell, F.R.I.B.A., F.G.S., "Gayton," Avenue Road, Highgate, N.

A New Church Extension Hall and Classrooms is being erected at Brighton Avenue, Gateshead. The scheme comprises a church to seat about 700, with hall to seat 500, ample classroom accommodation, and caretaker's house. Messrs. Badenoch & Bruce, Newcastle, are the architects for the work, and the contractor for the hall and classrooms is Mr. John Anderson, of Newcastle. The style adopted is late Gothic. The walls will be in stone, with hammer-dressed facing and chiselled dressings. The total cost, including the site, is estimated at £8,000. The present contract, which includes hall, caretaker's house, and classroom, will cost about £2,800, exclusive of site.

The New Central Offices at Bisley of the National Rifle Association are now in course of erection. The new building will afford accommodation for all. Large apartments will be provided for the accountants and range officers. The first floor will provide for the statisticians, linotype and oil-engine, with concrete floor. The telegraphists will have rooms on this floor also, and all the rooms will be connected by small lifts with the downstairs apartments. Upstairs there will also be a telephone-room and committee-room, and above the building will be erected a tower with a look-out and a camera obscura. The materials used will be red bricks and tiles. The cost will be £4,500. Mr. Alfred Burr, F.R.I.B.A., is the architect. "Uralite," a substance made of asbestos fibre, will be used in the construction of the building for the sake of coolness.

An Ilkley Competition.—A competition was recently held for designs for a New Baptist church and schools at Ilkley proposed to be erected on a site on the east side of Devon Crescent, off the Grove. Forty-two sets of designs were submitted and last Thursday, on the recommendation of their professional adviser, the Committee unanimously accepted the designs marked "A," the authors of which were Messrs. Garside & Pennington, architects, of Pontefract and Castleford. The designs provide for a church to seat 500, erected in free Gothic treatment in stone, with tower and spire, with red tiles, also a large schoolroom to seat 300, suites of classrooms, &c., conveniences, and caretaker's cottage. The total cost is estimated at £8,000. Messrs. Garside and Pennington have since received instructions to proceed with the work at once. Messrs. G. F. Danby and E. M. Simpson, of Park Row, Leeds, took second place.

Mountain Ash Municipal Buildings Competition.—Mr. J. H. Phillips, of Cardiff, whose design was placed first by the assessor Mr. G. Halliday, F.R.I.B.A., has been instructed to proceed with the work.

Hutton-Buscel Church, near Scarborough, was struck by lightning recently. The tower was wrecked, and over half a ton of debris fell with a great crash on to the roof of the main structure below. Fortunately nobody was hurt.

Sheffield Queen Victoria Memorial.—At a meeting of the Sheffield City Council held last week an amendment to refer back the question of the site of the Queen Victoria memorial was lost. The selected site of the Monolith is considered by local architects to be wholly unsuitable.

New Patents.

These patents are open to opposition until April 19th.

1900.—Ventilating and Flushing Drains.—20,219. I. SHONE and E. AULT, both of 47, Victoria Street, Westminster, S.W. The sewage is discharged into a tank or "flushing ejector," which, when filled, may be syphonically discharged by the flush from a water-closet, the discharge being very powerful. Air is drawn in and the ventilation of the drains thus effected. A safety valve is also provided which opens when a predetermined pressure is created in the system, and this prevents the traps being forced.

1901.—Saw-Sets.—4,912. J. MITCHELL, Packington Hill, Kegworth, Leics. The device consists of a small metal frame having a setting-plate with four bevelled edges at different angles, to suit different teeth. The tooth-setter has a spring attachment and is adjusted by a thumb-screw. The whole device is very small and neat.

Water-Supply Valves for Closets.—6,312. H. L. DOULTON, Lambeth Sanitary Engineering Works, Lambeth, S.E. This valve is primarily intended to work with a closet having two traps and emptied by syphonic action, the object being to give an after-flush. For this purpose two pistons are employed, one entering the valve and partially arresting the discharge before the valve is finally closed by the second piston.

The following specifications were published on Thursday last, and are open to opposition until April 26th. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1901.—3,349, SHAW, measuring instruments. 3,425, WILKINSON, stop-tap boxes. 3,966, HARGREAVES & HARGREAVES, guards for machinery. 4,052, STOBES, means for testing shot-firing cables in quarries. 4,865, BOULT (*Chisholm & Moore Manufacturing Co.*), cranes and hoisting apparatus. 5,587, GREENE, file and rasp cutting-machines. 5,617, FELL, pipe joint. 5,949, JEFFREY, valves, taps, &c. 6,031, STEAD & STEAD, chimney pots. 6,495, SMITH, machines for corrugating sheet metal. 7,016, JANDUS ARC LAMP & ELECTRIC CO., LTD., & JONES, electric arc lamps. 7,274, DOBBS BROTHERS, LTD., DOBBS & STONE, fixing terminals on stair and other rods. 7,594, OATES, tap for lavatory basins. 7,705, ALLISON, screw-jacks. 8,160, ACKROYD, ACKROYD & GILL, chimney pots, ventilators, &c. 9,369, LAKE (*Fallner & Ziegler*), rotary kilns. 9,471, RYAN, pipe joints. 14,635, BOULT (*Marsden*), machines for making bricks, briquettes, &c. 18,758, HOCHSTEIN, expansion joints for pipes. 19,525, WITTKOWSKY, split wood pulleys. 19,609, MAHER & BARNER, machines for grinding, smoothing and polishing glass. 22,702, RAE, saws. 22,713, ELLIS, paving blocks. 24,140, SCHECK, beams, columns, &c. 24,513, HARDEMAN, windows. 25,523, RUDIGER, sliding handle for staircases. 25,667, HADDAN (*Wayss & Freytag Aktiengesellschaft*), concrete floors and ceilings. 25,802, THOMPSON (*Perfect Sliding Door Co.*), sliding doors and windows. 26,063, BOULT (*Wilhelm & Guth*), glue pots. 26,529, SCHAEFER, soldering too's.

1902.—383, BROOKE & GLOSSOP, artificial stone.

Engineering Notes.

Electric Light in Stepney Parish Church is proposed to be installed instead of gas. The church is now being rebuilt, after the fire which occurred in October last.

The New Tramp Wards, Abbeydore, have been fitted with an improved hot-water heating apparatus by Messrs. John King, Ltd., engineers, of Liverpool.

Boiler Explosions.—The nineteenth annual report on boiler explosions issued by the Board of Trade states that during 1900-01 thirty-three persons were killed and sixty persons injured; the average numbers for the last nineteen years being twenty-nine and sixty-one respectively. As in previous years, the explosions were chiefly due to the deterioration or corrosion of the plates, &c., or to defects in the design, workmanship, material or construction.

Electric Tramways at Richmond.—The Richmond Town Council has sanctioned the introduction of the London United Co.'s tramways into the town from Hammersmith, via Barnes, on condition that the company pays an annual way-leave of £1,250, widens the streets to a minimum of 33ft., uses the overhead system in Mortlake Road only, and not Kew Road, and promotes no further extensions in the borough without leave of the Council.

The Purification of Air.—Colonel Ergledeue, late of the Royal Engineers, writing on the question of the purification of the atmosphere of the Houses of Parliament, suggests the use of ozone, which can now be produced from atmospheric air, free from nitrogenous products, at a most moderate cost, where an alternating current of electricity is available or can be provided. This also applies to the sterilisation of air in every description of public or private buildings.

New Mond Gas Works.—The Midland Electric Corporation for Power Distribution, Ltd., some time ago selected Tipton as the most suitable location for their enterprise, and now the South Staffordshire Mond Gas (Power and Heating) Co. have followed suit. The site for the Mond gasworks consists of thirty-two acres at Dudley Port, with an additional acreage of mines, which will ensure lateral support to the buildings to be erected. The site, which is freehold landed and mining property, is known as the "Burton Estate." It is in the centre of the area over which the company has Parliamentary powers, extending to 123 sq. miles. Plans are now being prepared for the erection of the works by the consulting engineer of the company, Mr. H. A. Humphrey (Westminster).

Acetylene Generators.—The report of the Committee on Acetylene Generators has been issued. Forty-six generators were tested. In every case a representative of the firm which submitted the apparatus was present, so as to ensure that the generator was worked under the most favourable conditions. The members of the Committee state that, while the generators in no instance showed evidence of being otherwise than safe under the conditions of the test to which they were subjected, many were in the opinion of the committee of a design unnecessarily and undesirably complicated, and some were not sufficiently strong in construction. Having regard to the conditions of use which must often prevail, the Committee considers that in the selection of an acetylene generator regard should be had to the following desiderata:—(1) Simplicity of action and design; (2) strength of construction; (3) high efficiency, as indicated by the yield of gas per lb. of carbide; (4) low pressure in generator; and (5) facility of removal of the residue.

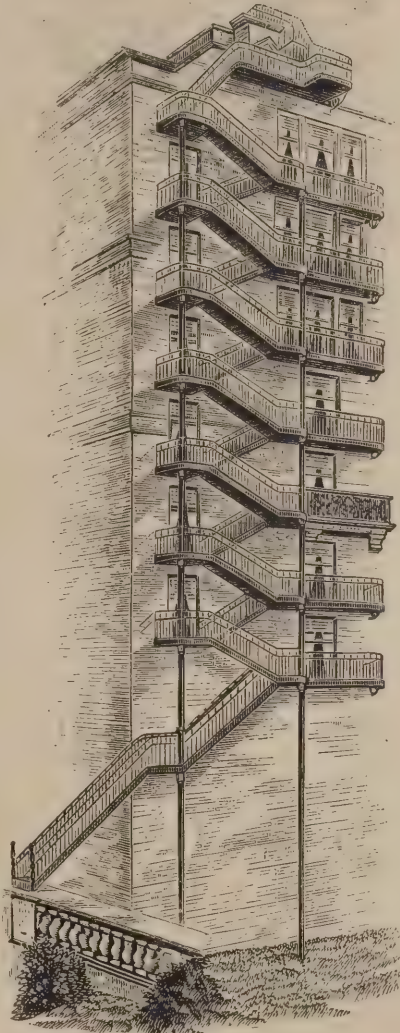
Masters and Men.

A Strike of Carpenters at Dartford occurred last week. Some thousands of men engaged in the construction of the small-pox hospital extensions of the Metropolitan Asylums Board came out. The carpenters demanded the payment of 1s. an hour instead of 11d., the rate hitherto paid for the work. At Gore Farm the men were satisfied with an increase to 11½d., but the men at Joyce Green to the number of 1,500 have ceased work for some days.

Trade and Craft.

Fire-Escape Staircases.

In 1900 the St. Pancras Ironwork Co., Ltd., erected two fire-escape staircases on the south or Piccadilly side of Hyde Park Court, W., that huge residential block facing Sloane Street. These gave such satisfaction that in the autumn of last year the firm received an order to erect two more on the north or park side of the building; and they have been already finished



FIRE-ESCAPE STAIRCASES, HYDE PARK COURT, W.

a month earlier than the contract time. Each staircase is in sixteen flights and is more than 100ft. high.

Greenhouses and Conservatories.

Messrs. W. Richardson & Co., horticultural and heating engineers, of Darlington, send us a copy of their new catalogue. We are glad to see that the majority of the illustrations are from photographs of actual work executed, and also that a number of sectional diagrams are included, showing clearly and simply the interior arrangements of the winter gardens, conservatories and greenhouses and the systems of construction adopted. It is intended that clients shall choose from these illustrations such as most closely conform to their requirements, and the firm will then prepare a special plan to fit, scale, with elevations and sections, to be submitted with the specification and estimate: an arrangement by which clients have the benefit of current prices based on the raw material bought in the cheapest markets: bricklayers' work or masonry, however, is not undertaken.

Messrs. Richardson have at their works a great variety of high-class machinery, besides which there is a siding from the main line of the North-Eastern Railway into their yard, thus effecting a great saving in cartage and labour. Special attention is paid to the quality, suitability and seasoning of the timber used, and the glass is selected to be as free as possible from "burning spot," the panes for the roofs being as a rule cut with elliptical-shaped ends so as to run the rainwater down the centre. The firm do not favour glazing without putty, but they have for many years made an improved form of glazing bar, which prevents the possibility of the putty cracking or peeling off. For stove and orchid houses, &c., a channel is formed at each side of all the bars and rafters, for conveying the condensed moisture into the outside gutters and so preventing it dripping upon the plants. A patent system of ventilation is adopted, 9in. openings being formed in the roof, the full length from ridge to eaves, and at distances of 5ft. centre to centre, the openings being fitted with ventilating frames. Bottom ventilation is obtained by wood "panels" the full length of the sides, and about 8in. deep, hung at the upper edges with brass hinges. Messrs. Richardson have executed a large amount of work for the nobility.

Surveying and Sanitary Notes.

The Southern Approach to Tower Bridge has just been completed. The new thoroughfare has been cut through a portion of Bermondsey by the London County Council at an estimated nett cost of £394,000. The scheme included the widening of Bermondsey New Road, by which the new street is connected with a great centre of traffic at Bricklayers' Arms, Old Kent Road, and the improvement will greatly facilitate the communication between the north and south of London. The new thoroughfare is 3,600ft. long and 60ft. wide, and about 150 properties have been acquired to make it. It was decided by the Council in 1892 to call it Tower Bridge Road, so far as the portion between Tooley Street and Grange Road is concerned, but whether the remaining portion, consisting of the widened Bermondsey New Road, shall have the same name applied to it is under consideration.

Kendal Sewerage.—Messrs. Beesley, Son & Nicholls, the engineers, in the report to the Kendal Town Council, state that most of the sewers in the borough are running nearly full bore, and this by reason of the defective joints. To remedy this there are three courses open:—(a) To lay out an entirely new system of sewers for the sewage proper, leaving the present sewers to act as subsoil and storm-water drains with new outlets to the river Kent. (b) To lay out an entirely new system of sewers for the sewage proper, and construct a new system of surface drainage at a higher level, with outlets into the river Kent. (c) To remedy the defective joints on the existing sewers, and construct a new system of surface drains at a higher level discharging at different points into the river Kent. They recommended method (c). The cost would be about £12,500. In respect to the sewage-disposal, they recommend the bacterial treatment of the sewage on the present outfall site. They estimate the cost of the sewage-disposal works at the sum of £21,525, as follows:—Septic or anaerobic tanks, £5,250; double contact beds, including storm bed, £14,800; laying-out land, £450; contingencies, 5 per cent., £1,025. Total estimate—Sewerage, remedying existing sewers, £12,500; new surface drainage works and storm overflows, £1,850; total, £14,350; sewage-disposal works, £21,525; total amount of estimate, £35,875.

"Light and Heat."—The first number of this new monthly magazine has just been published. It is a review of the gas, electrical and acetylene engineering industries, and is published at 5, St. Margaret's Offices, Victoria Street, S.W., price 3d.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BIRMINGHAM.—For rebuilding Waterworks Tavern, Birmingham, for Messrs. Truman, Hanbury, Buxton, & Co., Ltd., Mr. Charles Hook Collett, architect. Quantities by Mr. Henry Clover:—
Whitehouse & Sons ... £3,350 | Turton ... £3,143
Moorhouse ... 3,204 | H. Gibbs ... 2,921
Gowing & Ingram ... 3,175 | Morris ... 2,849
Lee & Son ... 3,160 | * Accepted.

BOGNOR (SUSSEX).—For the construction of a concrete tank sewer, 4 ft. in diameter and 1,050 ft. in length; also for the relaying of a 16-in. stoneware pipe sewer, and the laying of other 12-in. and 9-in. pipe sewers, for the Bognor Urban District Council. Mr. W. L. Barrett, engineer:—

With patent jointed pipes.	
E. H. King, Worthing ...	£7,300
J. Jackson, Plaitow ...	6,093
G. Osenton, Westham ...	6,500
E. H. King† ...	6,500
Tate Bros., Bognor ...	5,869
Grounds & Newton, * Bourne-mouth ...	5,083
With ordinary pipes.	
E. H. King ...	6,000
J. Jackson ...	6,205
G. Osenton ...	6,200
E. H. King† ...	6,180
Tate Bros. ...	5,244
Grounds & Newton ...	5,082
* Accepted. † Alternate.	

BUNCRANA.—For the erection of two houses, Cockhill Road, for Mr. P. Porter. Mr. J. P. McGrath, architect, 28 Carlisle Road, Londonderry:—

H. Campbell, Bunrana ...	£600
R. Colhoun, Londonderry ...	420

GATESHEAD.—For a length of about 600 yards of 18-in. fireclay pipes for the drainage of Saltwell Cemetery, for the Gateshead Corporation. Mr. J. Bower, borough engineer:—

D. Young, Elm Grove, Hexham ...	£3,323
J. Robson, Tankerville Place, Newcastle ...	3,292
G. Bell, 29, Corporation Street, Manchester ...	2,535
I. Bewley, Dunston ...	2,405
Brebnor & Co., 44 St. Andrew's Square, Edinburgh ...	2,315
J. Thompson, 19 Windsor Terrace, Gosforth, Newcastle ...	2,114
* Accepted.	

HALESOWEN.—For the kerbing, channelling, making, and draining of the following streets in Cuckmere, Blackheath, for the Halesowen Rural District Council: Green Lane, about 380 yards in length; Station Lane, about 310 yards in length; part of Master's Lane, about 80 yards in length. Mr. William Whitworth, Public Offices, Great Cornhill, Halesowen, surveyor:—
J. Mackay, Smeethwick, near Birmingham ... £2,187
Wheeler & Thompson, Old Hill, Staffs. ... 2,005
W. H. Jones, Great Tindal Street, Birmingham ... 2,030
J. A. Meredith ... 1,902
Curral, Lewis & Martin ... 1,929
Barnes & Co., Northfield, near Birmingham ... 1,892
W. Willetts ... 1,751
A. Cooper ... 1,708
T. Crumpton, * Hawne, Halesowen ... 1,445
* Accepted.

HEREFORD.—For rebuilding St. James's Church, Hereford, after fire. Messrs. Nicholson & Hartree, architects, Hereford:—
Smith, Kidderminster ... £5,707
King & Son, Gloucester ... 5,083
Hatch ... 5,400
R. Morgan, Kingston ... 5,270
Broad, Malvern ... 5,207
W. P. Lewis & Co., Hereford ... 4,875
W. Bowers & Co., Hereford ... 4,830
Beavan & Hodges, Hereford ... 4,682
C. Cooke, * Hereford ... 4,400
* Accepted after some variations and omissions. Arranged at £3,835 10s.

ILKLEY.—For the masonry and other works required to be done in the erection of the Cowpasture Bridge over Backstone Beck, for the Ilkley Urban District Council:—

Kell Bros., Leeds ...	£2,564 0 0
J. Brown ...	2,047 15 0
J. Forrest ...	1,990 0 0
E. Kellett, Bradford ...	1,988 0 0
J. Murdock ...	1,941 15 5
W. Barrand, Bradford ...	1,894 18 0
Horne & Maud, Horsforth ...	1,825 0 0
T. Egan & Sons, Bradford ...	1,812 18 10
Dean Bros. ...	1,607 1 9
* Accepted. [Rest of Ilkley.]	

JARROW.—For alterations and additions at the Higher Grade School, for the Hedworth, Monkton, and Jarrow U.D. School Board:—

S. Craig, 283 High Street, Jarrow ...	£1,336 8 8
J. A. Henderson, Park Road, Hedburn ...	1,270 19 0
J. Barrow, * 24 Croft Terrace, Jarrow ...	1,018 9 6
* Accepted.	

LEEK (STAFFS).—For the erection of a poultry market, for the Leek Urban District Council. Mr. John Myatt, town surveyor:—

T. Grace ...	£1,124 0
S. Salt ...	1,090 0
H. P. Embrey & Co., Fenton ...	1,067 17
J. Heath ...	1,055 15
Heath & Lowe ...	940 0
* Accepted. [Rest of Leek.]	

LONDON, W.C.—For rebuilding corner block in Strand comprising Carr's Restaurant. Mr. Walter Emden, M.S.A., architect:—

W. J. Bloxham ...	£20,800	Holloway Bros. ...	£25,779
F. & H. F. Higgins ...	27,500	Patman & Fotheringham ...	25,407
Spencer, Santo & Co. ...	27,225	Bateman ...	25,447
Martin, Wells & Co. ...	27,008	Kirk & Randall ...	25,447
T. L. Green ...	26,790	W. Sharnum ...	25,365
W. Greger & Son ...	25,723	Holliday & Greenwood ...	21,877
Downs ...	25,773	* Accepted.	
Hall, Beddall & Co. ...	25,838		

LONDON.—For enlargement of Mowlem Street School, for the London School Board:—
McCormack & Sons ... £3,308
Grover & Son ... 3,256
Leslie & Co., Ltd. ... 3,151
T. L. Green ... 3,147
W. Greger & Son ... 3,125
Clarke & Bracey ... 3,115
Snevin Bros. & Co. ... 3,080
Staines & Son ... 3,026
Treasure & Son ... 3,041
* Recommended for acceptance.

LONDONDERRY.—Accepted for alterations and forming business premises at Carlisle Road. Mr. J. P. McGrath, architect, 28 Carlisle Road, Londonderry:—
W. J. Boyd, Londonderry.

LONDONDERRY.—Accepted for the erection of residence at Lawrence Street (Foyle College Grounds) for Mr. W. N. McGuinness. Mr. J. P. McGrath, architect, 28 Carlisle Road, Londonderry:—
A. Dunlop, Rackville Street ... £280
[Amended tender, omitting painting and plumbing work.]

LONDONDERRY.—Accepted for the erection of three cottages at Lecky Road for Miss Gallagher. Mr. J. P. McGrath, architect, 28 Carlisle Road, Londonderry:—
J. Gallagher & Sons, Moville ... £275

PEAR TREE GREEN (HANTS).—For the erection of a new boys' school, High Street, Pear Tree Green, for the St. Mary Extra, Sholing, and Hound (U.D.) School Board. Messrs. W. H. Mitchell, Son, and Gutteridge, architects, 9 Portland Street, Southampton:—
Hinton Bros. Woolston ... £6,500
Witt Bros., Bitterne ... 6,475
H. Cawte, Shirley ... 6,178
T. Rashley, Southampton ... 6,083
Jenkins & Sons, Ltd., Above Bar, Southampton ... 5,985
Stevens & Co., * Northam, Southampton ... 5,880
* Accepted subject to the approval of the Educational Department.

PONTYPRIDD.—For the erection of an isolation hospital at Llantwit Fardre, near Pontypridd, for the Pontypridd Urban District Council. Mr. E. Rees, surveyor:—
W. Thomas & Co., Cardiff ... £8,094 16 0
Williams & James, Pontypridd ... 7,118 0 0
Morris & Thomas, Pontypridd ... 6,983 5 0
G. Rutter, Barry ... 6,902 14 0
W. E. Willis, Ystrad Rhondda ... 6,772 8 4
Price Bros., Cardiff ... 6,667 0 0
W. Davies, * Pontypridd ... 6,397 0 0
* Accepted.

WATFORD.—For the erection of nurses' homes, for the Guardians. Mr. C. P. Ayres, architect:—
Waterman ... £2,250
W. King ... 2,236
C. Eames ... 2,103
Toms ... 2,117
C. W. D. Reed ... 2,100
H. Martin, Northampton ... 2,035
B. Dewdney ... 2,050
Clark Bros. ... £2,020
H. B. Watkins ... 1,940
Tyler & White ... 1,980
G. Wiggins ... 1,910
Clifford & Gough, * Watford ... 1,867
C. Brightman ... 1,707
* Accepted.

WEALDSTONE (HARROW).—For the erection of a shop at Wealdstone. Messrs. Clarke & Charles, architects, the Harrow Estate Offices, Peterborough Road, Harrow. No quantities supplied:—
C. Simmons, Harlesden ... £750
J. & J. Bailey, Wealdstone ... 650
M. Dymock, Wealdstone ... 650

New Companies.

A. & J. Webster, Ltd.

Registered to acquire and carry on the existing business of builders, joiners, architects, timber merchants and sawmillers. Capital £5,000 in £5 shares.

Rolls & Linoms, Ltd.

Registered to carry on the businesses of manufacturers and sellers of varnishes, paints, colours, oils, brushes, &c. Capital £10,000 in £1 shares.

George Pollard & Co., Ltd.

Registered to acquire the business of English and foreign timber merchants, sawmill proprietors, building and general contractors, builders' merchants, owners of planing, turning, and moulding mills, marble, stone and slate merchants as now carried on at Wood Street, Taunton. Capital £5,000 in £1 shares. The directors are G. H. and H. S. Pollard. Registered office: Wood Street, E.C.

Standard Construction Corporation, Ltd.

Registered to construct, erect, maintain, execute, carry out, equip, improve, work, develop, administer, manage, and control works and conveniences of all kinds, including railways, tramways, docks, harbours, piers, canals, reservoirs, embankments, irrigations, reclamations, sewerage, drainage, sanitary, water, gas, electric light, telephonic, telegraphic, and power supply works, &c. Capital £150,000 in £1 shares. Registered office: Amberley House, Norfolk Street, Strand, W.C.

Henry Heys & Co., Ltd.

Registered to acquire the business of stone merchants, quarries, colliery owners, brick-makers, &c., as now and hitherto carried on at Stacksteads and elsewhere in Lancashire as H. Heys & Co., and to carry on the business of stone and marble merchants, stonemasons, quarrymen, colliery owners, brickmakers, dealers in clay, sand, loam, earth, timber, hardware and other building requisites, pipe, tile and terra-cotta makers, potters, &c. Capital £60,000 in £1 shares. The directors are J. Heys, W. Heys, and H. H. Ratcliffe. Registered office: Blackwood, Stacksteads, Lancashire.

Ballymena Brick and Tile Co., Ltd.

Registered for the purpose of acquiring about 60 acres of land at Ballylesson, near Ballymena, County Antrim, the property of Mr. Andrew McQuiston, and to continue and carry on the factory for making bricks and earthenware goods. Capital £10,000 in ordinary shares of £1 each and £5,000 5 per cent. first mortgage debentures. The directors are Sir George Pigott, Bart., Warfield Grove, Bracknell, Berkshire; John F. Sargeant, Bracknell; Andrew McQuiston, Bracknell; and John Campbell, Ballymena.

THE DREAD DISEASE

of Small-pox still retains its hold on London, despite all the efforts which have been made to stamp it out. Every reader in the Metropolis should

INSURE AGAINST IT

by adopting our Insurance Policy No. 3.

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Ordinary Risks, Premium, £3/-
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THE MANAGER, BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
March 20	Alnwick—Coach-House and Stable	Co-operative Society, Ltd.	Clerk of Works Office, Alnwick Castle.
" 20	Batley—Workrooms, &c.	"	H. B. Buckley, 85 Commercial Street, Batley.
" 20	Bradford—Terrace of Eight Houses	"	Empsall & Clarkson, 7 Exchange, Bradford.
" 20	Broughton Moor, Cumberland—Three Cottages	T. Irving	B. Ellbeck, Oraika Road, Dearham, Maryport.
" 20	Sandreed, Cornwall—House	"	H. Thomas, Botrea, Sincroed.
" 20	Tonbridge, Kent—Workhouse Ward	Union Guardians	F. W. Stone, 23 Church Road, Tunbridge Wells.
" 20	London, S.E.—Disinfecting Chamber, Stabling, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Lambeth Town Hall, Kennington Green, S.E.
" 20	Chichester—Business Premises	"	Saunders & Saunders, Architects, Arcade Chambers, Newark.
" 20	Shipley, Sussex—Alterations to School and Cottage	"	E. S. Arkle, Shipley Vicarage.
" 20	Wyke, Bradford—Additions to House	F. Hind	Fairbank & Wall, Architects, Craven Bank Chambers, Bradford.
" 21	Stockport—Alterations, &c., to Police Offices	Watch Committee	J. Atkinson, Borough Surveyor, St. Petersgate, Stockport.
" 21	London, W.C.—Lime, Cement, Bricks, Builders' Work	Holborn Borough Council	H. O. Jones, 197 High Holborn, W.C.
" 21	Southampton—Strong Room, &c.	Corporation	Borough Engineer, Municipal Offices, Southampton.
" 21	Chelmsford—Extension of Premises	Star Co-operative Society	Charles & W. H. Pertwee, Architects, Bank Chambers, Chelmsford.
" 21	Sheffield—Salesshops and Premises	A. Davy & Sons, Ltd.	Gibbs & Flockton, 15 St. James's Road, Sheffield.
" 21	Norwich—School	School Board	O. J. Brown, Architect, Cathedral Offices, Norwich.
" 21	Hoylake, Cheshire—Tiles, Cement, &c.	Urban District Council	L. G. Dasher, Surveyor, District Council Offices, Hoylake.
" 22	Macclesfield—Foundations, &c., to Infirmary Annexe	Corporation	H. Beswick, County Architect, Newgate Street, Chester.
" 22	Sutton Coldfield—Bricks, Cement, Lime	Urban District Council	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
" 22	Willenhall, Staffs.—Portland Cement, Paving Bricks	"	T. E. Fellows, Engineer, Town Hall, Willenhall.
" 22	Brea, near Camborne—Resealing, &c., Chapel	"	J. Jewel, Brea.
" 22	Langley Park, Durham—Clergy House	Town Council	Colliery Office, Langley Park.
" 22	Cambridge—Office at Market	Presbyterian Congregation	Borough Surveyor, Guildhall, Cambridge.
" 22	Warrenport, Ireland—Manse	J. W. Masters	W. J. Watson, Architect, Rostrevor.
" 22	Redruth—Villas	"	H. W. Collins, Architect, Walreddon, Redruth.
" 22	Totnes—Rebuilding Inn	"	W. F. Tollit, 10 High Street, Totnes.
" 22	Birmingham—Alterations to Parish Offices	Parish Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
" 24	Bradford—Additions to Nurses' House	Union Guardians	F. Holland, 11 Parkinson's Chambers, Hustlergate, Bradford.
" 24	Barrow-in-Furness—Lavatories, &c.	Corporation	Borough Engineer, Town Hall, Barrow-in-Furness.
" 24	Belfast—Renovation of Church	Presbyterian Congregation	Graeme-Watt & Tulloch, 77A Victoria Street, Belfast.
" 24	Bradford—Fifteen W.C.'s	Co-operative Society, Ltd.	Rycroft & Firth, Architects, Bank Bldgs, Manchester Rd., Bradford.
" 24	Hindley, Lancs—Alterations, &c., to Premises	Industrial Co-operative Society	Stores, 50 Market Street, Hindley.
" 24	Hyde Park, co. Antrim—Villa	Corporation	T. Houston, Architect, King's Court, Wellington Place, Belfast.
" 24	Leeds—Offices and Store-rooms	Rural District Council	City Engineer, Leeds.
" 24	Dartford—Pair of Semi-detached Cottages	Urban District Council	Tait & Hobbs, Architects, Lowfield Street, Dartford.
" 24	Epsom—Additions, Alterations, at Isolation Hospital	Urban District Council	E. R. Capon, Surveyor, Bromley Hurst, Church Street, Epsom.
" 25	Long Eaton—Engine-room, Boiler House, Chimney Shaft, &c.	Urban District Council	F. Worrall, Engineer, Council Offices, Long Eaton.
" 25	Poplar—Workmen's Dwellings	London County Council	Architect's Department, Housing Branch, 18 Pall Mall East, S.W.
" 25	Irlams o' th' Height, nr. Manchester—Carriage Shed, Offices, &c.	Lancs and Yorks Railway Co.	Engineer, Hunts Bank, Manchester.
" 26	Nottingham—Alterations, &c., to Offices	Works and Ways Committee	A. Brown, City Engineer, Guildhall, Nottingham.
" 26	Bachie, Llanfyllin—House	C. R. Jones	T. Ridge, Architect, Llanfechain.
" 26	Bridgewater—Chapel and School Premises	Methodist Connexion	R. M. Challice, 14 Bedford Circus, Exeter.
" 26	Maidenhead—Electric Generating Station	Town Council	P. Johns, Borough Surveyor, Guildhall, Maidenhead.
" 26	Cheltenham—Portland Cement	Town Council	Borough Surveyor, Municipal Offices, Cheltenham.
" 26	London, N.—Wall	Metropolitan Asylums Board	A. & C. Harston, 15 Leadenhall Street, E.C.
" 26	Chartham Downs, near Canterbury—18 Cottages	Kent County Asylums Committee	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
" 27	London, E.—Casual Wards	Stepney Guardians	F. R. Smith, 6 Great College Street, Westminster.
" 27	Halifax—Bakery, Stables, &c.	County Council	G. Buckley & Son, Architects, Tower Chambers, Halifax.
" 17	Sutton Ford, Essex—Bridge	"	P. J. Sheldon, Surveyor, County Offices, Chelmsford.
" 28	Gortin, co. Tyrone—Residence	"	J. M. Robinson, 7 East Wall, Londonderry.
" 29	Keighley—Beer Bothing Establishment and Residence	"	Barber, Hopkinson & Co., Architects, Oraven Bank Chbs., Keighly.
" 29	Faringdon, Berks—Three Houses	Parish Council	Belcher, Adkin & Belcher, Architects, Wantage.
" 29	Wemyss, Scotland—Cemetery Lodge, Mortuary, &c.	Lady Ashburton	W. D. Sang, C.E., Kirkcaldy.
" 29	Sherfield English, near Romsey, Hants—Church	Urban District Council	F. Bath, Architect, Crown Chambers, Salisbury.
" 29	Great Harwood, Lancs—Slaughter-houses	Urban District Council	A. H. Dunkin, Surveyor, Town Hall, Great Harwood.
" 29	Truro—School Classrooms	"	Carder & Carder, 4 Princes Street, Truro.
" 31	Madron, Chapel	Wesleyan Connexion	H. Maddern, 26 Clarence Street, Penzance.
ENGINEERING:			
Mar. 20	London, E.—Cables and Conduits	Stepney Borough Council	A. Wright, 27 Osborn Street, E.
" 20	Maryport—2 Cranes	Harbour Commissioners	F. Kelly, Clerk, Harbour Office, Maryport.
" 20	Liège, Belgium—Railway	"	Government Provincial, Liège.
" 20	Maryport—Hopper Barge	Harbour Commissioners	F. Kelly, Clerk, Harbour Office, Maryport.
" 21	Nelson, Lancs—Cistern, &c.	Gas Committee	A. J. Hope, Engineer, Gasworks, Nelson.
" 21	Totnes—Pipelining	Rural District Council	W. F. Tollit, Surveyor, Totnes.
" 21	West Pleann, Scotland—Pipelining	"	Crouch & Hogg, 53 Bothwell Street, Glasgow.
" 22	Brynmawr, Wales—Heating School	School Board	F. Baldwin, Architect, Abergavenny.
" 22	Hull—Laying Main	Corporation	F. J. Bancroft, City Water Engineer, Alfred Gelder Street, Hull.
" 22	Roscommon, Ireland—Waterworks	Rural District Council	T. T. O'Keefe, Clerk, Council Office, Roscommon.
" 22	Bailiff Bridge—Concrete Settling Tanks	"	J. F. Walsh & G. S. Nicholas, Architects, Museum Chbrs, Halifax.
" 24	Ilford—Electric Tramways	Urban District Council	W. C. O. Hawtayne, 9 Queen Street Place, E.C.
" 24	Brighton—Telephone Equipment	Town Council	A. R. Bennett, 65 Renfield Street, Glasgow.
" 24	Bamford, via Sheffield—Cableways	Derwent Valley Water Board	Engineer, Derwent Valley Water Bd. Offices, Bamford, via Sheffield.
" 24	Belmullet, Ireland—Reconstruction of Bridge	Mayo County Council	J. Clarke, Secretary, Court House, Castlebar.
" 24	Pickering and Kirbymoorside, Yorks—Waterworks	Rural District Council	J. E. Parker, Engineer, Post Office Chambers, Newcastle-on-Tyne.
" 24	Deal—Alterations to Outfalls	Corporation	Borough Surveyor, 23 Queen Street, Deal.
" 24	Leeds—Dry Gasometers	Gas Committee	R. H. Townsley, Gen. Manager, Gas Dept., Municipal Bldgs., Leeds.
" 25	Felixstowe and Walton—Groynes	Urban District Council	S. E. Fisher, Surveyor, Town Hall, Felixstowe.
" 25	Kilsyth, Scotland—Reservoir	Town Council	Kyle & Frew, 140 West George Street, Glasgow.
" 25	Walthamstow—Sledge-Pressing Plant	Urban District Council	G. W. Holmes, Town Hall, Walthamstow.
" 25	Oldham—Work and Material	Corporation Electricity Committee	A. Andrew, Gas and Water Offices, Oldham.
" 26	Norton and Prescott—Pipelining	Corporation	Water Engineer, Municipal Offices, Liverpool.
" 27	Ilford—Electrical Overhead Equipment, &c.	Urban District Council	W. C. O. Hawtayne, 9 Queen Street Place, London, E.C.
" 27	Castleford—Watercrks	Urban District Council	Richardson & Hartley, Engineers, East Parade Chambers, Leeds.
" 27	Ilkeston—Pumping Station	Water Board	G. & F. W. Hodson, Engineers, Loughborough.
" 27	Sutton Ford, near Rochford—Bridge	Essex County Council	P. J. Sheldon, Surveyor, County Offices, Duke Street, Chelmsford.
" 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
" 29	Gorton, Lancs—Sludge Presses	Urban District Council	C. J. Lomax, 37 Cross Street, Manchester.
" 31	Fairfield, Derbyshire—Drainage	Urban District Council	Sterling & Swann, Engns., Town Hall, Chapel-en-le-Frith, Stockport.
" 31	Ilomley, Cheshire—Sewage-Disposal Works	Urban District Council	E. Garside, Town Hall Chambers, Ashton-under-Lyne.
" 31	Glasgow—Railway	Glasgow and South-Western Railway Co.	Engineer's Office, St. Enoch Station, Glasgow.
" 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chbrs., Rockhampton, Queensland.
" 31	Manchester—Pipelining	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
IRON AND STEEL:			
Mar. 20	Lower Bebington, Cheshire—Gates	Urban District Council	H. W. Corrie, Surveyor, Council Offices, Lower Bebington.
" 21	London, W.C.—Castings, Smiths' Work, &c.	Holborn Borough Council	H. C. Jones, 197 High Holborn, W.C.
" 21	Bacup, Lancs—Ironmongery, Iron Castings, &c.	Corporation	Borough Surveyor, Bacup.
" 21	London, E.C.—Bridgework	Bengal-Nagpur Railway Co., Ltd.	Office, 132 Gresham House, Old Broad Street, E.C.
" 22	Brownhills, Staffs—Ironwork	Urban District Council	W. B. Chancellor, Engineer, Public Buildings, Brownhills, Staffs.
" 22	Wombwell, Yorks—Gas and Water Pipes, Tools, &c.	Urban District Council	J. Robinson, Clerk, Council Offices, Wombwell.
" 22	Sutton Coldfield—Bar-iron, Iron Castings, &c.	Corporation	W. A. H. Clarry, Borough Engineer, Town Hall, Sutton Coldfield.
" 22	Willenhall, Staffs—Stores	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
" 22	Burnley—Ironwork	Highways and Sewerage Committee	G. H. Pickles, Borough Surveyor, Town Hall, Burnley.
" 22	Withington, Lancs—Manhole Covers, &c.	Urban District Council	A. H. Mountain, Engineer, Town Hall, West Disbury, Manchester.
" 24	Cork—Cast-iron Pipes	Waterworks Committee	H. A. Outler, City Engineer, Municipal Buildings, Cork.
" 24	Rhyl—Cast-iron Pipes	Urban District Council	R. Hughes, 6 Vinmel Street, Rhyl.
" 24	Folkestone—Iron and Ironmongery	Corporation	A. E. Nichols, Borough Surveyor, Corporation Offices, Folkestone.
" 25	Bromley—Ironmongery, Ironfounders' Work, Tools	Urban District Council	F. H. Norman, Clerk, District Council Offices, Bromley, Kent.
" 25	Hastings—Storecks	Corporation	P. H. Palmer, Town Hall, Hastings.
" 26	Moss Side, Manchester—Manhole Covers and Gratings	Urban District Council	H. B. Longley, Engineer, Moss Side, Manchester.
" 26	Amsterdam—Rails, &c.	Netherlands Minister for the Colonies	M. Nuyoff, Bookseller, The Hague.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL—cont.:			
March 26	Skipton—Water Mains	Urban District Council	J. Mallinson, Engineer, Town Hall, Skipton.
" 27	Manchester—High and Low Pressure Pipes	Electricity Committee	F. E. Hughes, Secretary, Elec. Department, Town Hall, Manchester.
" 31	New Mills—Cast-iron Penstocks, Manhole Covers, &c.	Ludworth and Mellor Sewerage Board	E. Garside, Engineer, Town Hall Chambers, Ashton-under-Lyne.
April 1	Manchester—Bolts, Nuts, &c.	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
" 1	Christiania—Pipes, &c.	Stavanger Municipal Engineering Board	Stadsingeniør Kontoret, Stavanger.
" 14	Waterloo, Lancs—Lamp Columns, Manhole Covers, &c.	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
" 21	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
" 23	Calcutta—Stopcocks	Corporation	F. Gainsford, Secretary, Corporation Offices, Calcutta.
PAINTING AND PLUMBING:			
Mar. 20	Salisbury—Painting	Union Guardians	J. Harding & Son, 58 High Street, Salisbury.
" 20	Lower Bebington, Cheshire—Plumbing, Painting, &c.	Urban District Council	H. W. Corrie, Surveyor, 5 Castle Street, Liverpool.
" 22	Wombwell, Yorks—Lead Gas and Water Pipes, White Lead, Paint, Putty, Oil, Turpentine, &c.	Urban District Council	J. Robinson, Clerk, Council Offices, Wombwell.
" 22	Oxford—Painting, &c., at Cemeteries	Corporation	City Engineer, Town Hall, Oxford.
" 24	Folkestone—Paint, Varnish, &c.	Corporation	A. E. Nichols, Borough Surveyor, Corporation Offices, Folkestone.
" 24	Southall—Painting, Colouring and Repairs at Schools.	St. Marylebone Guardians	Superintendent, St. Marylebone Schools, Southall.
" 24	Nottingham—Painting, Colouring & Repairs, Infirmary	St. Marylebone Guardians	Steward, Infirmary, Rackham Street, Nottingham.
" 24	Ixworth, Sussex—Painting, &c., at Police Station	West Sussex County Council	A. Ainsworth Hunt, County Architect, Bury St. Edmunds.
" 25	York—Painting at Workhouse	Union Guardians	G. Robinson, Workhouse Master, York.
" 25	Bromley, Kent—Oils, Paints, &c.	Urban District Council	F. H. Norman, Clerk, District Council Offices, Bromley, Kent.
" 26	Parry, Glamorgan—Lead & Oompo Pipe, Sheet Lead	Gas and Water Committee	F. M. Harris, Engineer Offices, Barry.
" 27	Leicester—Cleaning and Painting Exterior Town Hall	Corporation	E. G. Mawbey, Borough Surveyor, Town Hall, Leicester.
" 28	Bootle, Cumberland—Whitewashing, Painting, &c.	Guardians	J. Clark, Clerk, Broughton-in-Furness.
ROADS AND CARTAGE:			
Mar. 20	London, W.—Carting-away Slop, &c.	St. Marylebone Borough Council	J. P. Waddington, Surveyor, Town Hall, Marylebone Lane, W.
" 20	Stockport—Street Works	Highways and Sewers Committee	J. Atkinson, Borough Surveyor, St. Peter'sgate, Stockport.
" 20	Cannock, Staffs.—Materials	Rural District Council	H. M. Whitehead, District Surveyor, Penkridge, Stafford.
" 20	Chester-le-Street, Durham—Materials, &c.	Rural District Council	G. W. Aytton, Highway Surveyor, Chester-le-Street.
" 20	Rothwell, near Leeds—Materials	Urban District Council	J. T. Pears, Surveyor, Council Offices, Rothwell, near Leeds.
" 21	Hoylake, Cheshire—Materials and Stores	Urban District Council	L. G. Dasher, Surveyor, Council Offices, Hoylake.
" 21	East Ham—Stores and Materials	Urban District Council	C. E. Wilson, Clerk, Public Offices, East Ham.
" 21	Bacup, Lancs—Materials	Corporation	Borough Surveyor, Bacup.
" 21	London, W.C.—Materials and Stores	Holborn Borough Council	H. O. Jones, 197 High Holborn, W.C.
" 22	Wombwell, Yorks—Granite, Lime	Urban District Council	J. Robinson, Clerk, Council Offices, Wombwell.
" 22	Brownhills, Staffs.—Materials	Urban District Council	W. B. Chancellor, Surveyor, Public Buildings, Brownhills, Staffs.
" 22	Horsesham, Sussex—Materials	Rural District Council	W. Dengate, 58 Park Street, Horsesham.
" 22	South Crossland, Yorks—Scavenging	Urban District Council	G. H. Mellor, Nuisance Inspector, South Crossland.
" 22	Wakefield—Street Works	City Council	City Surveyor, Town Hall, Wakefield.
" 22	Beverley, Yorks—Whinstone and Gravel	East Riding County Council	A. Beaumont, County Surveyor, County Hall, Beverley.
" 22	Driffield, Yorks—Materials	Rural District Council	T. O. Beaumont, Surveyor, Council Offices, Driffield.
" 22	Willenhall, Staffs.—Stores and Materials	Urban District Council	T. E. Fellows, Surveyor, Town Hall, Willenhall.
" 22	Burnley—Materials	Highways and Sewage Committee	G. H. Pickles, Borough Surveyor, Town Hall, Burnley.
" 22	Durham—Paving Material	Corporation	City Surveyor, Durham.
" 22	Wittington, Lancs—Materials	Urban District Council	A. H. Mountain, Surveyor, Town Hall, West Didsbury.
" 22	Sutton Coldfield—Materials	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
" 24	Maidstone—Road Repair and Maintenance	Kent County Council	F. W. Ruck, 86 Week Street, Maidstone.
" 24	Bridgewater—Road	Rural District Council	W. A. Collins, 66 Victoria Road, Bridgewater.
" 24	Chelmsford—Materials, &c.	Rural District Council	H. G. Warne, Surveyor, Avenue Chambers, Market Rd., Chelmsford.
" 24	Gateshead—Materials	Rural District Council	J. Bower, Borough Surveyor, Town Hall, Gateshead.
" 24	Leighton Buzzard—Granite & Picked Flints, Cartage	Wing Rural District Council	J. McKenzie, Surveyor, Linslade, Leighton Buzzard.
" 24	Morley, Yorks—Materials	Rural District Council	W. E. Putnam, Borough Surveyor, Town Hall, Morley.
" 24	Newbury—Road Repair	Urban District Council	H. S. Talbot, District Surveyor, Red Cottage, Cold Ash, Newbury.
" 24	Seaford, Sussex—Paving Works, &c.	Rural District Council	Surveyor, 3 Clinton Place, Seaford.
" 24	Wellington—Granite	Rural District Council	District Surveyor, Workhouse Wellington.
" 24	Folkestone—Materials	Corporation	A. E. Nichols, Borough Surveyor, Corporation Offices, Folkestone.
" 25	Godstone, Surrey—Materials, Stores and Cartage	Highway and Bridges Committee	J. G. Powell, Surveyor, Godstone, Surrey.
" 25	Gretton, Uppingham—Granite	Rural District Council	J. Fowler, Clerk, Uppingham.
" 25	Nuneaton—Material and Cartage	Rural District Council	A. Moreton, 1 Bond Street, Nuneaton.
" 25	Uppingham—Granite	Rural District Council	J. Fowler, Clerk, Uppingham.
" 25	West Malling—Granite	Rural District Council	J. Marshall, Surveyor, West Malling.
" 25	Stockton-on-Tees—Stores, &c.	Corporation	Borough Engineer, Borough Hall, Stockton-on-Tees.
" 25	Blackwell, near Mansfield—Making-up	Rural District Council	H. Silcock, 34B West Gate, Mansfield.
" 25	Ely, Cambs—Granite and Gravel	Rural District Council	E. B. Claxton, Clerk, Ely.
" 25	Bromley, Kent—Road Works, Tar Paving Materials	Urban District Council	Council's Surveyor Offices, Bromley, Kent.
" 26	Moss Side, Manchester—Materials, &c.	Urban District Council	H. B. Longley, Surveyor, Moss Side, Manchester.
" 26	Clayton-le-Moors—Materials	Urban District Council	A. Dodgson, Surveyor, Council Offices, Clayton-le-Moors.
" 26	Grassendale, Lancs—Materials	Garston Urban District Council	F. W. Bowden, District Surveyor, Public Offices, Grassendale.
" 26	Dorchester—Repairs	Rural District Council	F. H. Polkinghorne, 2 Dagmar Road, Victoria Park, Dorchester.
" 26	Hoo, Kent—Materials, &c.	Rural District Council	R. P. Smyth, Clerk, Strood.
" 26	Keymer, Sussex—Road Works	Cuckfield Rural District Council	E. Waugh, Clerk, Bolitro Road, Haywards Heath.
" 26	Ramsgate—Street Works	Corporation	Borough Surveyor, Albion House, Ramsgate.
" 26	Strood, Kent—Works and Materials	Rural District Council	G. W. Prall, Clerk, Workhouse, Strood.
" 27	Ashton-under-Lyne—Materials	Corporation	Borough Surveyor, Town Hall, Ashton-under-Lyne.
" 27	Caistor, Lincs—Granite and Slag	Rural District Council	A. A. Padley, Clerk, Council Offices, Caistor.
" 27	Lancaster—Materials	Rural District Council	W. Cumming, Surveyor, Lancaster.
" 27	Llangollen—Improvement Works	Urban District Council	Surveyor, Council Offices, Llangollen.
" 27	Ormskirk—Materials	West Lancashire Rural District Council	C. Law-Green, Chief Surveyor, Union Offices, Wigan Rd., Ormskirk.
" 27	Ramsey Huntingdonshire—Granite	Urban District Council	F. R. Serjeant, Clerk, Ramsey.
" 27	Canterbury—Materials	Roads and Survey Committee	A. C. Turley, City Surveyor, Guildhall Street, Canterbury.
" 29	Great Harwood, Lancs—Materials and Team Labour	Urban District Council	A. H. Dunkin, Surveyor, Town Hall, Great Harwood.
" 31	New Malden—Materials	Urban District Council	T. V. H. Davison, Dist. Council Offices, Cambridge Rd., New Malden.
April 1	Dartford—Street Works	Urban District Council	W. Haston, 8 Hythe Street, Dartford.
" 1	Waterloo, Lancs—Materials and Stores	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
" 9	Walsall—Materials	Rural District Council	F. W. Mager, District Surveyor, Aldridge, Walsall.
SANITARY:			
Mar. 20	London, S.E.—Sanitary Work, &c.	Southwark Union Guardians	G. D. Stevenson, 13 & 14 King Street, E.C.
" 20	Ardingley, Sussex—Sewer	Cuckfield Rural District Council	Mr. Beach, Surveyor, Munster Green, Haywards Heath.
" 20	Hull—Nightsoil Collection	Corporation	Inspector of Nuisances, Hanover Square, Hull.
" 20	Cannock, Staffs.—Drain Pipes and Disinfectants	Rural District Council	H. M. Whitehead, District Surveyor, Penkridge, Stafford.
" 21	Edinburgh—Sewer, &c.	Magistrates and Council	Interim Burgh Engineer, 1 Parliament Square, Edinburgh.
" 21	London, W.C.—Scavenging, &c.	Holborn Borough Council	H. O. Jones, 197 High Holborn, W.C.
" 21	Bacup, Lancs—Pipes, Waste Water-Closets, &c.	Corporation	Borough Surveyor, Bacup.
" 21	London, W.C.—Disinfectants, Drain Pipes, &c.	Holborn Borough Council	H. O. Jones, 197 High Holborn, W.C.
" 21	East Ham—Stoneware Pipes, Gully Fittings, Lime	Urban District Council	E. E. Wilson, Clerk, Public Offices, East Ham.
" 21	Hoylake, Cheshire—Drain Pipes, Disinfectants, &c.	Urban District Council	L. G. Dasher, Surveyor, District Council Offices, Hoylake.
" 22	Sutton Coldfield—Earthenware Pipes, &c.	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
" 22	Wittington, Lancs—Sewerage Pipes, Junctions, &c.	Urban District Council	A. H. Mountain, Surveyor, Town Hall, West Didsbury, Manchester.
" 22	Burnley—Earthenware Pipes, &c.	Highways and Sewage Committee	G. H. Pickles, Borough Surveyor, Town Hall, Burnley.
" 22	Willenhall, Staffs—Stoneware Pipes, &c.	Urban District Council	T. E. Fellows, Surveyor, Town Hall, Willenhall.
" 22	Brownhills, Staffs—Pipes, Disinfectants, &c.	Urban District Council	W. B. Chancellor, Surveyor, Public Buildings, Brownhills, Staffs.
" 22	Andover—Sewage Works	Town Council	Borough Surveyor, Town Hall, Andover.
" 24	Folkestone—Drain Pipes, &c.	Corporation	A. E. Nichols, Borough Surveyor, Corporation Offices, Folkestone.
" 24	Hindley, Lancs—Sewering	Urban District Council	A. Holden, Surveyor, Council Office, Hindley.
" 24	Tewkesbury—Sewers, &c.	Rural District Council	H. A. Badham, Clerk, Tewkesbury.
" 26	Erdington, near Birmingham—Sewerage Works	Highways and Buildings Committee	H. H. Humphries, Surveyor, Public Hall, Erdington.
" 26	Haywards Heath, Sussex—Sewer	Cuckfield Rural District Council	W. Beach, Surveyor, Munster Green, Haywards Heath.
" 27	Canterbury—Stoneware Sewer Pipes, &c.	Roads and Survey Committee	A. C. Turley, City Surveyor, Guildhall Street, Canterbury.
" 31	New Mills—Sewers, &c.	Ludworth and Mellor Sewerage Board	E. Garside, Engineer, Town Hall Chambers, Ashton-under-Lyne.
Apr. 1	Exmouth, Devon—Sewerage & Sewage-Disposal Works	St. Thomas Rural District Council	Cameron, Commin & Martin, 7 & 8 Bedford Circus, Exeter.
" 1	Waterloo, Lancs—Stoneware Pipes, Disinfectants, &c.	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.

COMPETITIONS OPEN.

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Mar. 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Elge, Sheffield.
" 28	Waterford Public Free Library	—	J. J. Feeley, Town Clerk, Waterford.
" 29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
" 31	Wakefield—Improvement of Interior of Exchange Buildings	£25, £10.	J. J. Martin, Bull Hotel, Wakefield.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
" 8	Oldham—Market Hall and Shops	£50, £30, £20.	S. A. Pickering, Borough Surveyor, Oldham.
" 21	Coleraine—Twenty-five Workmen's Dwellings	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
" 30	Glasgow—Branch Library (Local Architects)	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 1	Mexborough, near Rotherham—Accident Hospital	£35 £10.	C. Brampton, Fern Villa, Mexborough.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprava, St. Petersburg.
No date.	Ilkeston—Public Free Library	£30, £25, £12 10s.	H. J. Kilford, Borough Surveyor, Town Hall, Ilkeston.
"	Bedminster—School	(Ltd. to Bristol Architects)	W. A. Adams, Clerk to Bristol School Board, Bristol.

COMING EVENTS.

Wednesday, March 19.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Works of the Incandescent Electric Lamp Co., Ltd., Brook Green, Hammersmith, 2 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS INSTITUTION.—Ordinary meeting at 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration in the District of Islington, and at the Borough Disinfecting Station, at 2 p.m. Conducted by Mr. James R. Lesgett, Mr. W. Spinks, A.M.I.C.E., on "Calculations, Measurements and Plans and Sections," at 7 p.m.

SOCIETY OF ARTS.—Mr. J. Clifton Robinson on "Electric Traction: London's Tubes, Trams and Trains," 8 p.m.

Thursday, March 20.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

CARPENTERS' COMPANY, Carpenters' Hall, E.O.—J. Alfred Gutch, F.S.A., F.R.I.B.A., on "Early Renaissance Buildings in England," 8 p.m.

SOCIETY OF ARCHITECTS.—Mr. Walter G. Williams, Solicitor, on "The Desirability of an alteration in the law relating to Ancient Lights," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Sanitary Appliances," 7 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Mr. James Swinburne and W. R. Cooper on "Problems of Electric Railways," 8 p.m.

Friday, March 21.

ARCHITECTURAL ASSOCIATION.—Mr. W. H. Lever on "The Dwellings erected at Port Sunlight and Thornton Hough," 7.30 p.m.

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COMING EVENTS—cont.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.O.E., on "House Drainage," 7 p.m.

ROYAL INSTITUTION.—Geheimrath Prof. Otto N. Witt, Ph.D., F.O.S., on "Recent Developments in Colouring Matters," 9 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Mr. Henry D. Marshall on "Fencing of Steam and Gas-Engines"; Mr. Samuel R. Platt on "Fencing or Guarding Machinery used in Textile Factories"; Mr. Henry O. Walker on "Protection of Lift Shafts and Safety Devices in Connection with Lift Doors and Controlling Gear," and Mr. W. H. Johnson on "Guarding Machine Tools," 8 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Papers on "The Prevention of Damp in Walls, (a) 'from External Causes,' by Mr. James McLeod; (b) 'from Internal Causes,' by Mr. Alexander W. R. Bell, 8 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. F. E. P. Edwards, A.R.I.B.A., on "Elme's Work in Liverpool."

Saturday, March 22.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Mr. John McDonald on "Water Turbines."

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Glasgow.

HARTLEY COLLEGE ENGINEERING SOCIETY, Southampton.—Mr. D. R. Bennett on "The Construction of Roads and Streets," 7 d.m.

ROYAL INSTITUTION.—Lord Rayleigh on "Some Electrical Developments"—VI., 3 p.m.

ARCHITECTURAL ASSOCIATION.—Fourth Spring Visit to the Roman Catholic Cathedral, Westminster, at 2.30 p.m., and New Police Station, Cannon Row (New Scotland Yard), 4 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at Beddington Sewage Farm, at about 3 p.m., conducted by Mr. Thomas Walker, M.I.O.E.

Monday, March 24.

SURVEYORS' INSTITUTION.—Discussion on Mr. C. H. Bedells's paper on "The Insurance of Buildings against Fire," 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. W. H. Lever on "Port Sunlight," 6 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. E. Worth, M.I.O.E., on "Water Supply, Sources of Supply and Distribution," 7 p.m.

Wednesday, March 26.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at the East London Water Works, Lea Bridge Road, Clapton, at 3 p.m., conducted by Mr. W. B. Bryan, M.I.O.E.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Meeting).—Mr. David Beveridge on "Sir John Vanbrugh and his Work," 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

DEVON AND EXETER ARCHITECTURAL SOCIETY. (Plymouth, Devonport and Stonehouse Branch).—Mr. A. S. Parker, A.R.I.B.A., on "Building By-laws."

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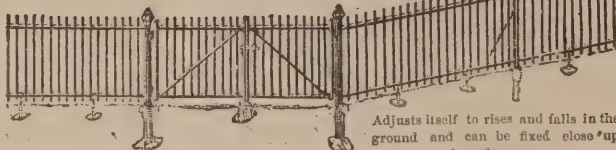
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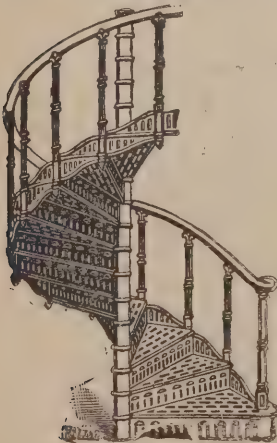
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Lead, white, ground, carbonate do.	1 4 10	—	
Do. red do.	1 0 4 1/2	—	
Linseed Oil, barrels .. do.	1 10 9	—	
Petroleum, American .. per gal.	0 0 6 1/2	0 0 7	
Do. Russian .. do.	0 0 6 1/2	0 0 6 1/2	
Pitch per barrel	0 7 0	—	
Shellac, orange .. per cwt.	5 16 0	—	
Soda, crystals .. per ton	3 2 6	3 5 0	
Tallow, Home Melt .. per cwt.	1 11 0	1 12 0	
Tar, Stockholm .. per barrel	1 3 6	—	
Turpentine .. per cwt.	1 10 6	—	
METALS.			
Copper, sheet, strong .. per ton	71 0 0	—	
Iron, Staffs, bar .. do.	6 7 6	8 10 0	
Do. Galvanised Corru- gated sheet .. do.	11 12 6	11 15 0	
Lead, pig, Soft Foreign .. do.	11 12 6	—	
Do. do. English common brands .. do.	11 17 6	—	
Do. sheet, English 31b per sq. ft. and upwards .. do.	13 0 0	—	
Do. pipe .. do.	13 10 0	—	
Nails, cut clasp, 3in. to 6in. per ton	9 0 0	—	
Do. floor brads .. do.	8 15 0	—	

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Do. Riga .. do.	6 15 0	8 10 0	
Do. Petersburg 1st Yellow .. do.	9 0 0	15 0 0	
Do. do. 2nd .. do.	10 0 0	11 10 0	
Do. do. White .. do.	7 5 0	11 10 0	
Do. Swedish .. do.	11 5 0	15 10 0	
Do. White Sea .. do.	10 10 0	11 15 0	
Do. Quebec Pine, 1st .. do.	19 10 0	21 5 0	
Do. do. 2nd .. do.	9 0 0	18 10 0	
Do. do. 3rd & 4th .. do.	9 0 0	—	
Do. Canadian Spruce, 1st .. do.	7 10 0	9 5 0	
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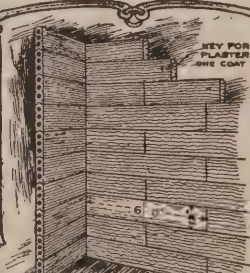
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Royal Academy Exhibition, 1902.

The receiving day for architectural works is
Thursday, March 27th. We shall be pleased, as
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intending exhibitors and to forward them (free
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however, can be received by us later than noon
to-morrow.

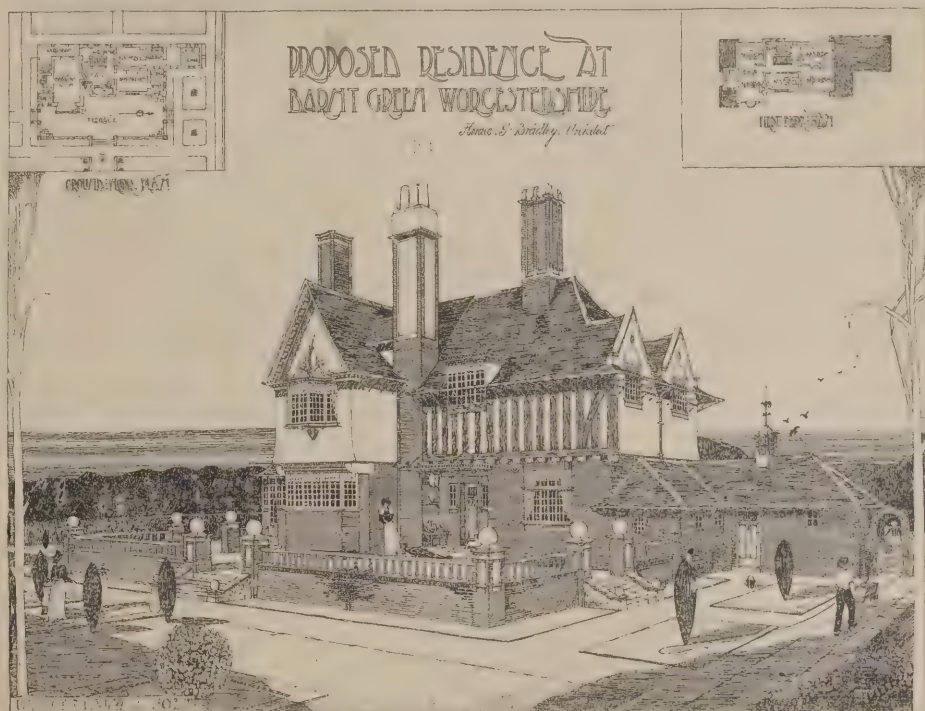
An Architectural Causerie.

The Stuffy House. QUITE recently the methods adopted for ventilating the House of Commons have again been the subject of discussion. One thing is certain—the atmosphere of the House, however free it may be from dust, smoke and other impurities, is oppressively dead; and just as “Dr. Ox’s Experiment” so exhilarated people that they verged on madness, so, in inverse ratio, the depressing, still, torpid air of St. Stephen’s reduces members to a state of lethargy. Considerable temporary improvement would be effected if, during the dinner half-hour—and even during some divisions—the windows of the House were thrown open and the fresh air allowed to sweep in, smoke-laden, fog-laden and acid-laden though it be: those who have the benefit of living in it certainly find it healthy, and doubtless our honoured legislators would be similarly benefited by their Gothic box being refreshed by a good breeze once in a while.

A Suggestion to the Scientists. ALL the world knows by this time of the new Physical Laboratory in Bushey Park which the Prince of Wales opened last week. There the physicists, freed from vibrations and the influences of iron and electricity, may work out the great problems which confront them, taking measurements of pieces of metal accurate to the millionth of an inch and of temperature to hundred-thousandths of a degree. Might not the work be extended in scope so as to include architecture? For hundreds of years architecture as Art has been periodically set forth by the prophets, but the questions of “style” are equally harassing to-day, and while some regard the Italian Renaissance as the apotheosis of architecture others prefer a modern factory or an engineering workshop. These prophets have failed to prove conclusively that architecture is an art: why, therefore, should the scientists not attempt to prove that it is Science?—of course embodying their laws in such phraseology that nobody can understand exactly what is meant. The idea is naturally not a new one, for in a modified way we find it among the Greeks, though its com-

plete adoption does not occur till the Georgian period, when Palladio took the place of a manufacturer’s catalogue, being afterwards discarded in favour of the Gothic copy-book with its faultless repertory. But our scientists could go farther than these. They might establish beyond dispute what diameter a column of a certain height must be, whether of the elongated or the rainwater-barrel type; what constitutes originality, and, if there is no such thing, how it can be obtained; whether or not architecture is frozen music, and, if so, whether ornament may be notated, and buttresses made subject to the laws of counterpoint, and, by consequence, whether the architectural curriculum in our schools should include a course on the harp, violin, cornet, banjo or other instrument; to determine—if need be to ten places of decimals—whether architectural assistants do really assist, and, if so, whether they are greater, abler and more intelligent in every respect than their principals; to determine why committee-men know more about architecture than the assessors engaged by them; to determine why a photograph of a building is false, and, if not, why an exhibition perspective is——all these vitally

buildings struck by lightning; the intention being to test the results accruing from the rules laid down by the Lightning-Rod Conference twenty years ago. The first-named committee has succeeded in enlisting the services of more than 200 observers in the United Kingdom, including the War Office, the Home Office, the Post Office and the Trinity House Corporation, similar observation being also available in foreign countries. So far, about seventy trustworthy records have been collected, these including photographs, which are of the greatest interest and importance. Up to the end of last year sixty cases had been tabulated, and of these no fewer than twelve concerned buildings which were furnished with some kind of lightning conductor, which is ample proof that the presence of such a “protection” does not necessarily prevent a catastrophe. Sufficient data has not yet been obtained to test the efficacy of the system recommended by the Lightning-Rod Conference, but evidence tends to show that this system is not altogether satisfactory, and if the Committee by thus scientifically collecting trustworthy reports and drawing practical conclusions from them can determine what are the essentials in



important problems await solution, and who more qualified to undertake the work than the scientists? Euclid being a science, and assuming architecture to be one also, might not a new system of building construction be formulated which would do away with the present text-books and replace them by a Government work based on the problems of Euclid? For example—*theorem*, to construct a town hall on a given crooked site; or—*theorem*, to design a library without resort to copying; or again—*theorem*, to build a house without extras. Complete solutions to these problems would be of inestimable service: yet hitherto the scientists have rigidly evaded them: now is their chance.

House, Barnt Green. THE house at Barnt Green, near the Lickey Hills, in Worcestershire, will be constructed of small Leicester sand bricks with half-timber, white stucco and plaster in the gables. Broseley tiles will be used on the roof. The total cost is estimated at about £2,000.

Lightning Research Committee. ABOUT a year ago the committee known as the Lightning Research Committee was formed by the Councils of the Royal Institute of British Architects and the Surveyors’ Institution, with the object of collecting and tabulating information in regard to

any system of lightning protection, they will be rendering a very great service to the community, and particularly to architects, builders and house-owners.

Houses for Fifty Years. IN the course of the paper which he read last Friday before the Architectural Association Mr. Lever contended that while the industries had all discarded old methods in favour of new, architecture had failed to keep up with the times; with the result that, so far as the housing question was concerned, it was found impossible to build houses which could be let at a rental sufficiently low to be within the means of the labouring classes: and his special contention was that modern needs demanded such houses to be built to last, not hundreds, but tens of years. This is a question which cannot be disposed of in a few words, but there is certainly much truth in Mr. Lever’s proposal. It is well enough with Sir Christopher Wren to talk of building for eternity; and because architects have always had this idea before them they have neglected to attack the problem of cheap houses, leaving the work to the jerry-builder. There is undoubtedly a large field for experiment here, and we commend the matter to those architects who are able to show an equal perception of the needs of the present day as their fellow-workers the naval architects have shown in shipbuilding.



NO. 39, CHEYNE WALK, CHELSEA, LONDON: STUDY. C. R. ASHBEЕ, ARCHITECT.

THE CHURCH OF THE SACRED HEART, PARIS.

THREE great monuments stand out prominently as records of the modern history of France: the first is the Madeleine, the memorial church to the victims of the Revolution; the second, the Arc de l'Etoile, the vast triumphal arch of the Napoleonic era; the third, the great church of the Sacre Cœur, raised in memory of the victims of the Commune, and now virtually complete on the heights of Montmartre. It is placed on a lofty hill dominating all Paris; a steep climb awaits the visitor; from the summit of the hill he looks down over the vast expanse of the city and notes with sorrow its rapid spoiling by volumes of smoke from countless tall chimneys; all around him is the ancient tumbledown village or suburb (it is hard to say which) with brown-tiled roofs and dormer windows, its old church of St. Pierre and its "Calvary." The new church is placed close to the edge of the precipitous height, so close, indeed, that on one side it rises over a retaining wall, the west front being approached by terraces and flights of stone stairs. The most conspicuous object in the view for many miles, its design is simple and its leading features boldly marked. In plan it is very nearly a Greek cross, though the nave is just sufficiently prolonged to say that it is a Latin one. Its great feature is the dome, with four smaller cupolas about it. These are of dazzling white stone, surmounted by small lanterns—if the word may be applied to a ring of tiny columns supporting a very small cupola. A striking peculiarity is that all the domes are covered with white stone scales arranged in bands, resembling the system known as scale slates. Externally the body of the church is very plainly treated; the details are Romanesque and the windows small and round-headed; its appearance is rather that of a mausoleum than an ordinary church, and this, perhaps, was deliberately intended. Internally it bears the same character, simple and even stern; vaulted throughout, with an apsidal east end surrounded by a ring of chapels, each ending in a semi-dome. The building is fairly large and lofty, but cannot be called vast. The drum of the central dome is pierced with a ring of round-headed windows; upon its pendentives are the figures of four angels which seem to adhere to the face of the spandrels and are not visibly supported, a somewhat questionable system of ornament for which precedents may be found in Italy—some of the vast figures in St. Peter's at Rome, for instance, being very insecure in appearance. The interior as a whole is dignified, well proportioned and effective. In the future presumably the internal walls will be largely adorned with mosaic.

Throughout the church one sees frequent evidences of M. Paul Abadie's long study of "the forty churches of Aquitaine" and other Romanesque and traditional buildings of south-western France; all of the period when the Gothic arch was struggling into existence and the Roman slowly passing away.

The site chosen for this new cathedral is one of the most remarkable in Europe, and the building, though severe, is not wanting in that character of striking or dramatic effect which a French architect, if given a free hand, perfectly understands: though it is debatable whether domes of such unusual form—unusual in Europe at least—are the most effective that could have been chosen.

[At the moment of going to press we have received from M. Henri Rauline (the architect under whose direction the cathedral is now being completed) a fine photograph of the interior and two plans. These will be published in our next issue, together with some additional particulars of the building.—ED. B. J.]



NO. 39, CHEYNE WALK, CHELSEA, LONDON: DINING-ROOM. C. R. ASHBEЕ, ARCHITECT.

Correspondence.

Architecture and Cigarettes.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—On opening a packet of cigarettes the other day I found therein a photograph, not of an actress, nor a footballer, nor even a British general or politician, but of a cathedral! We are so ready to lament the signs of the times that when we come across a "saving sign" like this ought we not to publish it far and wide? Such was my first thought. Visions of a cigarette-smoking public taking an intelligent interest in the cathedral architecture of the land flitted before my eyes. I looked at my photograph more closely. It was a view of Chester Cathedral from the south-east in all the newness of the nineteenth-century dress with which Sir Gilbert Scott clothed it. But underneath was the legend: "Chester Cathedral. Built in 1034"—only that and nothing more, and my golden visions melted away. It is there in black and white for thousands of smokers to read, and they will enquire no further, but just rest content to know that Chester Cathedral was "built in 1034"!—Yours truly, F. H. C.

The Ink-Bottle.

To the Editor of THE BUILDERS' JOURNAL.

BIRMINGHAM.

SIR,—The following idea will perhaps be of use to some readers, especially to those familiar with the disastrous consequences of a spilt ink-bottle in the drawing-office:—A plain glazed tile about 3in. square (such as no doubt will be found among the office samples) is taken and cleaned. The ink-bottle is next corked and turned upside down. Its concave bottom is then filled with gum or other adhesive, the tile is laid on it, and the whole reversed right side up. When set the device will be found very serviceable—it may also be used as a paper weight.—Yours truly, H. T. W. G.

Houses in Cheyne Walk.—The fronts of these houses by Mr. C. R. Ashbee, illustrated in our centre plates this week, are of 2in. Bracknell bricks with hard Bath-stone dressings. The balls and domes on the railings are gilt. The sideboard shown on the opposite page is in oak, partly stained and polished. The study has some eighteenth-century panelling taken from an old house formerly on the site.

LEADWORK.

By F. W. TROUP, F.R.I.B.A.

A PAPER on "Leadwork" was read recently by Mr. F. W. Troup, F.R.I.B.A., before the Sheffield Society of Architects and Surveyors. Mr. Troup said:—Few people realise to what extent lead was formerly used in the art of building. The ease with which the metal could be reduced from the ore made its use possible with the rudest of appliances. Once reduced to the metallic state it is one of the most imperishable of the metals. It is at the same time the easiest of them all to melt, to cast or to fashion into various shapes, either in the molten or solid state. We find examples of lead having been used in Babylonia, in Egypt, in Greece, and extensively in Roman times. There are many examples of Roman coffins and cists and ingots in the various museums. In the crypts of St. Paul's Cathedral I have seen Roman water-pipes stacked in heaps of old lead. This is kept to be melted down when required for new sheathing for the dome or other parts of the roof. I do not suppose that in this year of grace, 1902, a Roman water-pipe would be sacrificed in the melting-pot, even of St. Paul's Cathedral, but that was the obvious intent when the pipes were stacked there. Doubtless many have ere now been melted up, and that which once conveyed water to Roman London now conveys the rainwater from the dome to the drains of the cathedral. In mediæval times lead was used for covering the roofs of the finest buildings, also for covering and decorating spires of churches and cathedrals. The London churches particularly were noted for their fine lead-covered spires, chief of them all being that on old St. Paul's. Stow says this was 520ft. high—260ft. stone and 260ft. lead-covered spire. It was burned down in 1561, a century before the great fire of London. Much earlier than this, in 1090, we find (as quoted by Lethaby) the Bishop of Coutances, in Normandy, sending to England for Brisenetus, the plumber, to make afresh the leadwork for the roofs and tower. Numerous though the examples of English leadwork in church and palace were, and still are, I doubt if we have left to us quite such gorgeous examples as are to be found in some of the French roofs, spires and flèches. But I have touched on examples enough to show how much esteemed lead was for practical use in the Middle Ages, and how well the plumbers rose to the occasion, displaying their leadwork so that it held its own with any of the materials used in the greatest of their masterpieces. Yet, with all this, the work was often all done on the site of the building. No elaborate machinery or complicated tools were needed. The plant consisted of a frame about 4ft. or 6ft. wide and 12ft. or more long, on which a sand-bed could be laid. Besides this, little more was wanted except a pot in which to melt the lead. The molten metal was flooded over the levelled bed of sand, and from the sheet so cast everything could be wrought, bossed and beaten up, whether it were a flat sheet for roofing, or a crocket on a spire, or a lead-covered angel on a pinnacle. Various parts were cast in the same sand-bed by imprinting moulds or patterns and running the molten lead into them, but the great mass of the work was beaten up from the flat sheet, and the great art of the plumber consisted in fixing, laying or hanging his lead in such a way as to cover and protect the roof or spire from wet and yet keep his soft and ductile metal from slipping or dragging itself off. If care were taken that the sheet should not tear nor crack by the contraction of the metal at night after being beaten on by a hot summer sun, there was no reason why the material should not last for ever—excepting fire, from which no material is safe that rests on a wooden sub-structure. Gradually the use of lead for anything but the most utilitarian purposes died out, and now "plumber" and "sanitary engineer" are almost convertible terms. The "leadwork" of a building conjures up pipe casings or the grand display of sanitary waste-pipes, overflows and ventilators, culminating in the inevitable cowl that tells of modern sanitation. There is, however, no reason why lead should not be restored to its ancient prestige and be used once more as a material whereon the workman can display his fancy and lavish his labour of love.

SUPPORT FOR ADJOINING BUILDINGS.

By J. F. CARR.

"THERE are some things," said Lord Chancellor Selborne in a well-known judgment, "of which all men ought to be presumed to have knowledge, and among them (I think) is the fact that according to the laws of nature a building cannot stand without vertical or (ordinarily) without lateral support." Certainly all persons engaged in any capacity in building houses must be aware of this simple truth, but perhaps all are not aware of the extent to which one man's house may claim the support of another man's land as a legal right.

It has always been a popular sentiment that a man may do what he likes with his own, but the law imposes an important qualification, namely, that in so doing you must not, except in certain cases, damage another man or his

call it "the servient tenement" as opposed to "the dominant tenement") can prevent this effect arising from the twenty-years' uninterrupted support is by obtaining an acknowledgment in writing during that period from the owner of the building that he uses such support only by permission of his neighbour and is willing on demand to remove the pressure caused by the building. If such acknowledgment cannot be obtained the only course is to remove the support before the twenty years elapse, having first carefully ascertained that the rights are as they appear to be. The removal of the support for this purpose may be an expensive and, in some cases, a practically impossible course to adopt, and this is undoubtedly the reason why this right or, in legal term, this easement is more frequently acquired by enjoyment for the prescribed period than any other.

It must be remembered, however, that the right acquired is only to support as extensive as has been enjoyed for the twenty years. The



SIDEBOARD IN DINING-ROOM, NO. 39, CHEYNE WALK, CHELSEA, LONDON.
C. R. ASHBEER, ARCHITECT.

property. I may, it is true, dig away my land right up to the boundary line to get brick-clay or quarry chalk or slate, or simply for my own amusement; but if I thereby cause my neighbour's house to sink on one side and his walls to gape, serious questions may arise between us in the settlement of which a knowledge of what the law is may prove useful.

The first proposition to be laid down is as follows:—If a man builds a house on the edge of his land he does so at his own risk, and unless he gets his neighbour, expressly or by implication, to agree not to remove the support of the adjacent land he has no remedy if his neighbour chooses to do so.

Secondly, if a building has stood for twenty years, and has stood owing to the support of the adjacent land, the owner of such adjacent land will be taken, whether he likes it or not, to have agreed to allow such support; and if he removes it and damages the house he will have to pay compensation. The most simple way in which the owner of the supporting land (or as lawyers

existence of a greenhouse, for instance for twenty years imposes on the neighbour an obligation to support a building of equal but not of greater weight. In connection with this apparently simple proposition difficult questions have arisen. A building may exercise a certain number of tons pressure for a time, and then owing to internal alterations that pressure may be multiplied by three or four. What weight then will the neighbour's land be obliged to bear?

The instance which caused this question to arise in the law courts and ultimately to require the decision of the highest tribunal of appeal—the House of Lords—was that of a private house which was converted into a coach factory: the internal walls were removed and girders inserted in such a way as to throw much more lateral pressure than before upon the adjoining plot of land. After very elaborate argument and after asking the advice of Her Majesty's judges the House of Lords decided that if the alterations were carried out without any deception or

concealment the right to the support of the increased weight would be acquired after twenty years from the date of the alteration. It is not necessary that the owner of the supporting land should have exact knowledge or, in fact, any knowledge of the increased burden on his land if it appears that the alterations were not made surreptitiously or secretly.

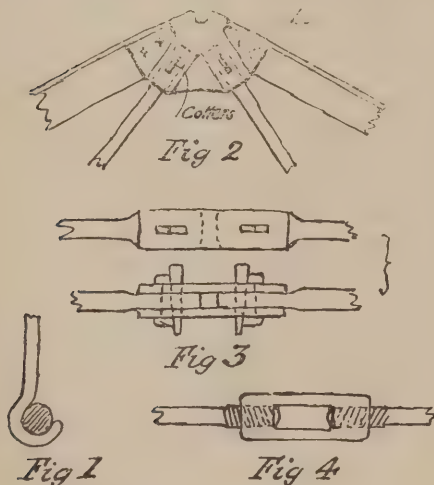
It may be added that, although for the purposes of illustration it has been simpler to state the law as between a building on the one hand and a plot of adjoining land on the other, the same general principles would apply to the case of one building supporting another, though not to the case of one plot of land supporting the adjoining plot of land if the latter is unencumbered by buildings.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Details of Iron Roof.

CAMBERLEY.—PUPIL writes: "The joint at E on the accompanying sketch of a roof-truss taken from my text-book (not reproduced) 'may be made by widening out the tie-rod and driving a hole to allow the king-rod to pass through and then securing it with a couple of nuts. In order to avoid interfering with the tie-rod a clip is frequently formed at the end of the queen-rod. This embraces the former instead of passing through it.' Two other cases in the same book puzzle me. 'In place of the joint at the apex of the truss shown in the figure, a cast-iron head might have been used with an arrangement for tightening up the tension rods. This is usually



DETAILS OF IRON ROOF.

done by forming rectangular slots in the head and ends of the tension rods. When the latter are in position these slots nearly coincide. A steel wedge or cotter is then driven in so as to draw the parts together, the friction being reduced by means of a gib on each side of the wedge. How could this be done? 'In some cases the tie and tension rods in an iron roof are divided in the middle, an arrangement being adopted for tightening them up either by means of cotted joints or screw shackles.' What are 'cotted' joints?"

Apparently the same rod is called both king-rod and queen-rod, but it is really neither, being only a small suspension rod. It has nothing to do but fill in the space to make a symmetrical appearance, as the tie-rod needs no support there. Fig. 1 shows a sketch of the clip joint referred to. It is not usual to put a cast-iron head to a wrought-iron roof-truss, but it might be made as Fig. 2. Gibs are not required with the cotters in a casting. The cotted joint in tie-rod, Fig. 3, requires a gib on the outside to hold the

thin cover-plates together while driving the cotter. Gibs do not reduce the friction but spread it over a larger surface, and for this reason a second gib may if desired be used with each cotter in Fig. 3. The screw shackle referred to is a coupling-box for drawing the two portions of the tie-rod together, as Fig. 4, the threads being right- and left-handed.

HENRY ADAMS.

Architects acting as Quantity Surveyors.

ENQUIRER sends us a very closely-written letter of two sheets and encloses a list of fifteen questions which he desires to be answered. Our columns are not intended to be treated as solicitors' "Requisitions and Replies," and we would again draw attention to our request that all enquiries shall be as brief as possible. These are some of the fifteen questions, as sent: "Can an architect be a surveyor (quantity or measuring)? Ought he to be so? If not, why not? If so, how so? Is he wrong when he measures and makes out a 'bill' from his own plans, &c., to issue to builder? If wrong, how and why?" &c., &c. The rest can be inferred from our reply.

There is not the slightest objection that can be sustained against an architect acting as his own quantity surveyor; in fact, he undoubtedly is the best person to take out the quantities, as he can best read his own plans and knows what he wants. Unfortunately we are compelled to admit that in the majority of cases the architect is not qualified to make out a good bill of quantities that will be a material and accurate aid to the builder in estimating; and unless the architect is fully cognizant of the general and recognized methods of giving the builder the information he requires a quantity surveyor had better be employed, though, as we have said, he can never equal an architect who is also a competent quantity surveyor. If a surveyor is employed, the architect should always have the same one, as he becomes familiar with the architect's methods and with the way in which the work is desired to be done. The architect should of course obtain the client's sanction to his preparing a bill of quantities, or engaging a surveyor to do so, but if he is asked to obtain estimates (which can only be properly done by having quantities taken out) we consider he is fully entitled to do so himself or engage a surveyor to do so, and charge for the work. The architect occupies the peculiar position of being partly the agent of the client and partly an arbitrator between the latter and the contractor, and it is as an arbitrator that he acts as quantity surveyor. If he conscientiously carries out his obligations in this respect, acting honourably to all parties, no one can reasonably object, but if any one makes objection another person should be selected agreeable to client, architect and builder. It is not right to make the builder pay for the quantity surveyor or his fees, as the latter is engaged at the request of the client and should be paid by him. The absurdity of the usual method is seen in the builder having to pay for copies of the quantities supplied to his competitors. If a surveyor is agreed to by client, architect and builder (in tendering the last shows his agreement) the arbitrator's award must be put up with. Therefore, if the surveyor is engaged direct by the client without the architect's consent, the latter cannot be held responsible for any disagreement that may arise—such as may occur should the tenders largely exceed the amount the client is prepared to spend. If, however, the client can show that the architect is in error, he will of course be held responsible. Several cases bearing upon the subject will be found on p. 302 of our issue for November 14th, 1900: see also the case reported on p. 85 of this issue.

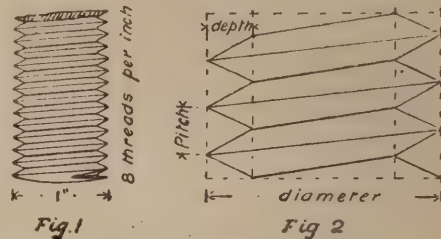
Laying Floors in Market Room.

WELLINGTON.—C. R. D. writes asking how a pitch-pine floor should be laid down over the worn boarded floor of a large market room, giving a slight spring for dancing; and also how a deal movable floor (for market purposes) should be constructed over the pitch-pine one. We learn from the expert to whom this enquiry was sent that he has already answered an identical question from the same correspondent in another journal; and we do not therefore feel disposed to publish a second reply.

Setting-out Screw Threads.

LONDON, S.E.—H. C. H. M. writes: "Kindly show me a method for setting-out screw threads."

There are many varieties of screw threads, according to the purpose for which they are to be used; there are also various conventional methods of drawing them besides the two geometrical projections of the helical curves. You do not say which you require. The accompanying sketch, Fig. 1, shows the ordinary working drawing of a thread of a lin. bolt, the principle of the construction being indicated in the enlarged and somewhat exaggerated view, Fig. 2. It will be observed that the threads are



SETTING-OUT SCREW THREADS.

right-handed, i.e. inclined upwards to the right and requiring the nut to be screwed on clockwise. This inclination of the thread causes it to form what is called the pitch, i.e., the rise performed in one revolution. The depth of the thread is drawn equal to the pitch, though in reality it is rather less, owing to the rounding off at the top and bottom. It is called a plus thread when it stands out from the main diameter of the rod, as in good tie-rods, and is called a minus thread when it is cut in below the general diameter of the iron, as in ordinary bolts. If this information is not sufficiently complete a further query should be sent.

HENRY ADAMS.

Taking Levels.

CARLISLE.—K. L. writes: "Can the levels of a building site be taken sufficiently accurately with a balance level to make it worth an architect's while to buy one for use on small jobs and for taking preliminary levels of larger ones?"

Yes.

Carrying Roof-Trusses over Opening.

LONDON.—ENQUIRER writes: "It is proposed to add a new wing to a building, and the wall which supports the roof-truss is required to be taken out. Would the method shown on the accompanying sketch (not reproduced) be the best to adopt? No columns or girders are to be used. Kindly give dimensions for members of new truss."

The sketch submitted is so rough that there is considerable doubt as to the work required. Apparently only one roof-truss is to be carried over the opening and no other truss is shown between this and the gable wall about 18ft. distant, which is not likely to be correct. Taking the load to be carried as 5 tons at the centre of the 20ft. span, a 10 by 6 by 45lb. rolled steel joist would be the simplest support, with a 12 by 6 by 1/2 wrought-iron plate screwed up under the end of the existing truss to spread the pressure. The new trusses could then be made of ordinary scantlings. Gable boards may be tenoned and pinned into finial; mitring as shown would be of no use.

HENRY ADAMS.

Section of Compound Girder.

C. F. M. writes (but does not give name or address, which is contrary to our requirements): "I have to construct a girder of the following section II. The load is 40 tons distributed and the space 16ft. I wish to use two 12in. by 5in. girders, and find from a manufacturer's list that a 12in. by 5in. will carry 13.75 tons over 16ft. How can I determine the size and thickness of the top and bottom plates required? Also, how could I determine the sizes, &c., of the complete section?"

Designing and calculating girders cannot be explained fully in the reply to a query, as there

are so many points requiring consideration. A study should be made of such a work as "The Practical Designing of Structural Ironwork" (E. & F. N. Spon, 125, Strand, London, W.C., 8s. 6d.) and Part I. of second series of "Designing Ironwork: Steel Girders" (Spon, 1s. 6d.). With built-up or compound girders the formula $\frac{wl}{8d}$ should be used and the depth assumed, but

when the depth is less than $\frac{1}{15}$ of the span a

higher factor of safety must be used to provide against undue deflection. Two 12 by 5 by 39lb. rolled steel joists with two 12 by $\frac{1}{2}$ in. plates will carry 40 tons over 16ft. span with a factor of safety of 4 to 5 according to quality.

HENRY ADAMS.

Lighting Billiard-room.

WINDERMERE.—LIGHT writes: "I am about to build a billiard-room 23ft. long, 18ft. 6in. wide and 11ft. 6in. high (bedrooms over). The walls on three sides are to be arranged for pictures. I propose to put in two windows at each end 7ft. by 3ft., and two of the same size on the side, with the fireplace between, the windows to be 6in. below the ceiling and the sills inside to be slightly sloping. Would there be sufficient light from these six windows to show up the pictures fairly well?"

If you can possibly manage it a toplight is the best. However, if the conditions preclude this we think you have done the best in the circumstances by getting the most light from the sides. There would be plenty of light for the pictures.

Responsibility of Architects for Lifts.

J. P. J. writes: "We are the architects for extensive additions to an hotel, part of the extensions being the installation of hydraulic passenger- and dinner-lifts worked by a water tank which existed before the alterations commenced. We obtained estimates in the ordinary way without any express instructions from the directors as to speed. After the estimates were obtained and submitted to the directors the matter remained in abeyance for a time while the directors instructed an expert to advise them as to the most economical power to be used, hydraulic or electric. The expert's report, which was handed to us, stated that the existing 4in. main would be sufficient, but we made an error in reading that the 4in. main referred to was the main for driving the passenger-lift, whereas it referred to the 4in. pipe by which the water was pumped by steam-power up to the tank. Consequently, we informed the makers of the lift that 5in. mains would not be required, with the result that the lifts do not work as quickly as the directors wish, and they have obtained estimates for increasing the speed, an alteration which would cost £350, which amount they intend claiming from us. We should be glad to know your opinion on the matter. After the estimates were sent in the directors decided that the passenger-lift should go up a floor higher, thereby diminishing the speed; and they also decided that the single-service passenger-lift should be made a double-service, so that the original 2in. main had to be increased to 3in., thereby diminishing the speed of the passenger-lift. At the request of the company, their consulting architect, with ourselves, drew up a report certifying that the building was completed to his and our entire satisfaction, which report the company have accepted."

You undoubtedly made a mistake in misreading the expert's suggestion as to the size of the main required, and in my opinion you are liable for any damage which may have been caused by the error. This is largely qualified by the following considerations:—You are liable, as I have said, for the damage caused by the mistake. It is not at all clear (from the case as stated) that any damage whatsoever resulted from the alteration of the main from a 5in. main to a 4in. main. It is usual in the erection of lifts to leave a considerable margin of power, which precaution no doubt was adopted by the expert in this case, and it is very possible that were it not for the alterations in the extended height the lift had to run, and the double-service required by the directors after plans and estimates had been accepted, the existing power would have been quite sufficient

to give them the speed they required. Of this you are the best judges. If you are of the opinion that a 4in. main would give power sufficient to supply the required speed, were it not for the alterations in the plans made by the directors against your wish, then in my opinion no damages, or at most only nominal damages, could be recovered against you; if, on the other hand, the slowness of the lift is the undeniable result of your error, then the amount of the damages recoverable against you will be the amount of the injury suffered by the company; in other words, the amount the owners will have to pay to put their premises into that condition in which they would have been were it not for your mistake. There is another consideration and a very important one altogether outside the question as to whether or not any injury has occurred to the company's property by your negligence and mistake. This consideration is, have the works executed and modifications made by you (whether by error or otherwise) been adopted and ratified by the directors? If such is the case, there is no doubt you have a perfect defence to any action they may bring. I am of the opinion that the directors have ratified what you have done, and waived any claims against you in respect to the lift to any mistake you made regarding the reading of the expert's report. What makes me form a rather strong opinion on this point is that the defect in the lift (*i.e.*, the speed which was self-evident on a trial) was a patent not a latent defect; such being the case, if the chairman and directors of the company, their consulting architect, and your employers examined it, it must have been self-evident and could not have escaped their notice. You state this examination was made and the work passed. If this was so, I consider you have a complete defence against any action which may be brought against you by the owners or your employers.

W. JOHNSON-ROBERTS.

School Planning.

LONDON, N.W.—A. A. W. writes: "Where can I obtain information about the planning of a first-class boarding school for boys in a country town?"

"School Architecture," by E. M. Wheelwright, to be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C., price 21s. nett.

Temple at Eleusis.

KETTERING.—LEIGH writes: "Where can I obtain particulars of the Ionic temple at Eleusis, a plate of which is shown in Mr. Phené Spiers's book on the Orders?"

See p. 93 of our issue for September 5th, 1900.

Books on Hospitals.

LONDON, N.W.—HOSPITIUM writes: "Kindly name some books dealing with the construction of hospitals, more especially accident hospitals."

Sir Douglas Galton's "Healthy Hospitals," Sir H. C. Burdett's "Cottage Hospitals" and "Hospitals and Asylums of the World." These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Constructing Walls.

KENT.—BORDER writes: "I am designing a country public-house, the external walls up to the first floor being 1½ bricks thick, rough-casted on the outside, the walls above this being half-timbered. Is the accompanying detail (not reproduced) suitable?"

The detail you propose is sufficient, but the proportions of the concrete are much too poor; 3 to 1 should be used, or at least 4 to 1. With 6in. of concrete there should be some cross-ties in the half-timbering.

Specific Gravity.

WALSALL.—STUDENT writes: "Where can I obtain elementary information on the subject of specific gravity? Is there any book dealing with the question?"

There are many books published dealing with the question: an elementary book giving explanations of what specific gravity is and how to ascertain it is Hugh Gordon's "Elementary Course of Practical Science, Part I." (Macmillan & Co., price 1s.).

Law Cases.

A Morecambe Architect's Claim.—The case of *Howarth v. Gardner and Another* was recently heard in the King's Bench Division of the High Court of Justice. The action was brought by Mr. Herbert Howarth, architect and surveyor, of Morecambe, against Mr. John Gardner and Mr. John Scott, proprietors of the Alhambra Palace, Morecambe, to recover £379, the balance alleged to be due for professional services in connection with the erection of the Alhambra Palace. Defendants denied that there was anything due, and counterclaimed for damages for alleged negligence. It appeared that in the summer of 1899 the defendants acquired the West End Market at Morecambe for the purpose of erecting a music-hall. In the course of the erection various alterations were made and the building, when completed, was a theatre instead of a music-hall. The total cost of the building was £25,779, including £1,579 for electric plant, £1,050 for furniture, &c., and £2,585 odd for plastic decorations.—Having carefully considered the evidence given at the trial, Mr. Justice Bucknill came to the conclusion that the plaintiff was entitled to receive from the defendants £1,312, less £1,160 which had been paid on account. He was also of opinion that the defendants had failed on their counterclaim. Therefore he gave judgment for the plaintiff on the claim for £152 and also on the counterclaim, with costs.

Bills of Quantities are not Warranties: Important

Appeal Case.—In the Court of Appeal last Wednesday judgment was given in re an arbitration between *Ford & Co. and Bemrose & Sons, Ltd.* The facts were as follows:—In 1895 the defendants, Messrs. Bemrose & Sons, Ltd., instructed Mr. Ernest R. Ridgeway, architect, to prepare plans for the erection of certain works at Derby, and to invite tenders for the work. The plaintiffs, Messrs. Ford & Co., tendered upon the architect's plans and specification, conditions of contract and bill of quantities, and with such tender furnished a schedule of prices. This schedule was for determining the amount to be paid or allowed in respect of any alterations from the original plans during the progress of the work, and the prices were referred to in the contract as the prices upon which it was based. The plaintiffs' tender having been accepted by Ridgeway on behalf of the defendants, a contract for £10,559 was entered into on May 28th, 1895. The works were completed, and on April 1st, 1897, Ridgeway gave his final certificate, showing a balance owing by the defendants of £1,530 13s. 5d. The plaintiffs were dissatisfied with the final certificate, and certain questions, disputes and differences arose between them and the defendants; and, in accordance with the contract, the matters in dispute were referred to arbitration. The arbitrator found that the quantities on which tenders were invited were substantially insufficient, and that the actual quantities of the works required exceeded those set forth in the bill of quantities. The arbitrator also found that there was a general usage in the building trade that where tenders are invited for the erection of works in accordance with plans, and a bill of quantities is furnished, a person making a tender is not expected to verify the quantities himself, but is expected and intended to assume the correctness of the quantities and to tender upon that assumption, and that if such quantities prove to be greater or less than the actual quantities the price is to be reduced or increased by an amount ascertained and determined by the scale of prices given in the tender as the scale by which payments for extras are to be determined. The arbitrator made his award in the shape of a special case. He submitted the following questions for the opinion of the Court:—(1) Whether in ascertaining the amount to be paid by the defendants to the plaintiffs regard was to be had to the aforesaid usage in the building trade. (2) Whether the plaintiffs were entitled only to be paid the sum of £10,559 mentioned in the contract, with such deductions and additions as were provided to be made in respect of alterations and deviations. (3) Whether the plaintiffs were entitled to be paid the value of all the works actually executed by them for the defendants at the prices upon which the contract was

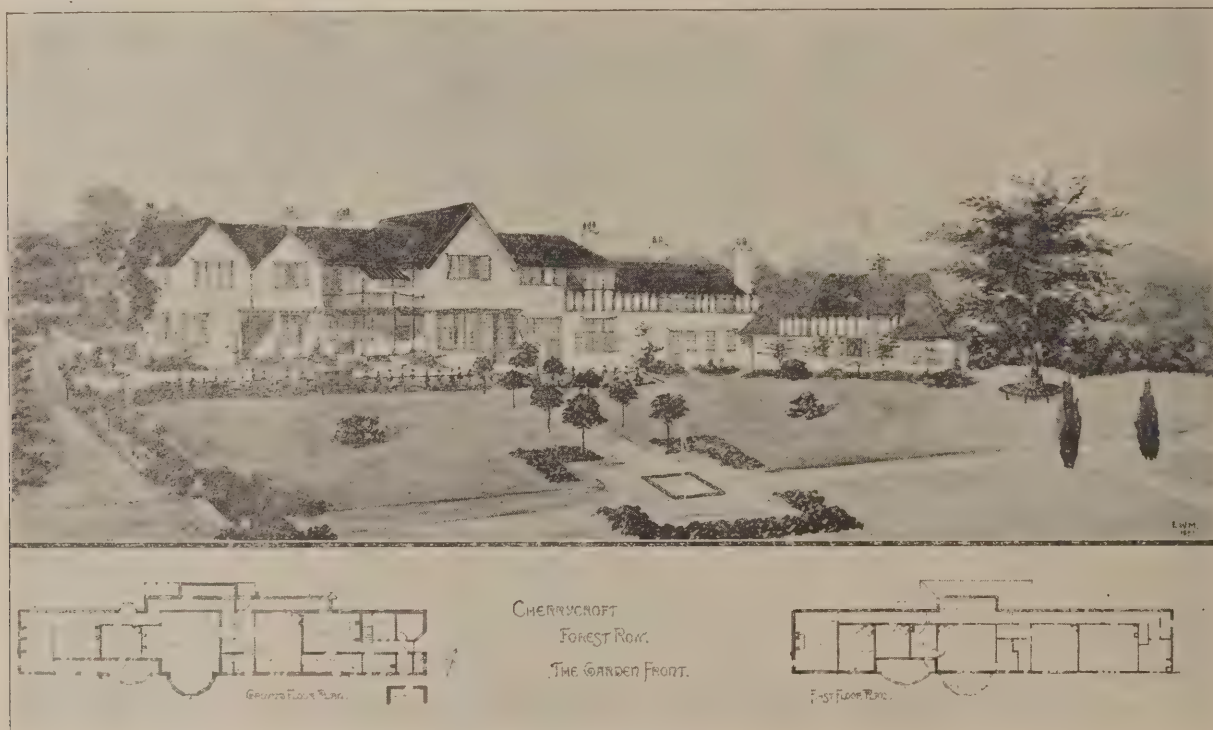
based, whether such value should be more or less than £10,559. And he made his award in the alternative as follows: If regard was to be had to the usage in the building trade the sum of £5,090 remained payable by the defendants to the plaintiffs. If the plaintiffs were entitled only to be paid £10,559, with such deductions and additions as were by the contract provided to be made in respect of alterations or deviations from the original plans, the sum of £2,303 remained payable. If the plaintiffs were entitled to be paid the value of all the works actually executed at the prices on which the contract was based, whether such value were more or less than £10,559, the sum of £5,090 remained payable. The Divisional Court were of opinion that the plaintiffs were entitled to be paid the value of the works actually executed at the prices on which the contract was based, and they gave judgment for the plaintiffs for £5,090. The defendants appealed.—The Court allowed the appeal.—The Master of the Rolls said that the bill of quantities, though not mentioned in the contract itself, was set out on the back of the specification. It now turned out that the quantities were too small, and the question was, what was the effect of there being this mistake in the bill of quantities? The Divisional Court held that the quantities constituted a binding part of the contract, and that

of apparent hardship. But he thought the answer to that argument was that it was competent for the builder to make his own estimate, and that if he chose to rely on the architect's estimate he backed his opinion just as much as the building owner did in favour of the architect's capacity to make a correct estimate. With regard to the custom which had been found by the arbitrator, he thought it was a custom which contradicted the contract and which could not be maintained. On that point he did not differ from the Divisional Court. Dealing with the questions which had been submitted by the arbitrator, he answered the first in the negative, the second in the affirmative and the third in the negative.—The Lords Justices delivered judgment to the same effect.

House Drainage: An Appeal Case under the Public Health Act.—The case of the *Woodford Urban District Council v. Stark* was recently heard in the King's Bench Division of the High Court of Justice. The respondent notified the appellants of his intention to erect two houses in Maybank Road, Woodford, and a block plan showing a combined drain for the two houses was attached to the notice. The notice and plan were disapproved by the appellants on the report of their surveyor on the ground of unsatisfactory drainage, and they made an order under the Public Health Act, 1875, section 25, ordering

ought to decide. That question was whether a house had been built without a drain constructed in a manner approved by the local authority. They could not decline to entertain the matter because the local authority had pointed out that the drain drained two houses connected together. It was argued that although the combined construction drained two houses, yet as the two houses were one building there was no offence under the section. That was a wrong view of the legal obligation under section 25. Whatever might be the true meaning of the word "building," he thought that section 25 was a distinct enactment that a person who erected a house must provide a drain for that house. Unless that was the true view he might provide a construction which would become a sewer and impose upon the local authority the obligation of repairing it. He thought that section 25 meant that there should be a separate drain for each house, and the case must go back to the magistrates, as they were not justified in refusing to deal with it on its merits, because the complaint of the local authority was in respect of the fact that the drain was for more than one house. The other learned judges concurred, and the appeal was accordingly allowed.

Electric Light Wires in Urban Districts.—The case of *Finchley Electric Light Co., Ltd. v. The Finchley Urban District Council* was recently



the bill of quantities amounted to a warranty by the building owners that the statement of quantities therein contained was correct. In his opinion it was a well-ascertained practice that the building owner placed before the builder documents specifying the materials on which he was to make his tender. But he thought it was equally well understood that a bill of quantities, whether it formed part of the specification or was a separate document, was not intended to be a representation in the sense of being a warranty. It was an estimate which the builder might act on as an honest estimate made by a qualified person, but it was not a warranty. It could not be pushed beyond an estimate and turned into a contract. He referred to the cases of *Sharpe v. San Paulo Railway Co.* (8 Ch. App., 597), *Servener v. Pask* (L.R., 1 C.P., 715) and *Thorn v. Mayor of London* (1 App. Cas., 120) as authorities to show that a bill of quantities, though scheduled to a contract, only constituted a representation, a suggestion or an estimate, and did not amount to a warranty. The argument for the appellants really sought to substitute a contract by measurement for a contract for a lump sum. He thought it was perfectly clear that the contract with which they had to deal was a contract for a lump sum. The Divisional Court seemed to have been influenced by the argument

that a separate drain should be made for each of the houses. This section provides that it shall not be lawful in an urban district to erect a house unless a covered drain or drains be constructed of such size and materials and at such level and with such fall as on the report of the surveyor may appear to the urban authority to be necessary for the effectual drainage of such house. The surveyor on subsequent inspection found that the respondent had constructed a combined drain for the two houses as shown on the plan, and the appellants caused two informations to be laid against him—one in respect of each house—for building a house without making a covered drain or drains of such size and materials and at such a level and with such fall as appeared to the appellants necessary on the report of their surveyor. The attention of the justices was called to *Matthews v. Strachan* (1901, 2 K.B., 540). The justices were of opinion that the appellants were not entitled to take into consideration anything but size, level, materials and fall, and that they had no jurisdiction to order a separate drain for each house, and accordingly dismissed the informations. It was contended for the respondent that the two houses constituted one building.—The Lord Chief Justice, in giving judgment last week, said that it seemed to him that the magistrates had overlooked the question that they

heard in the King's Bench Division of the High Court of Justice. The company sought an injunction to restrain the council from preventing them carrying their wires over a certain road in the district. Under the Public Health Act of 1875 the road became vested in the council, who contended that they were entitled to restrain the company from carrying their wires over it. The latter, on the other hand submitted that the soil of the road was not, in fact, vested in the council. Mr. Justice Farwell said the conveyance of the land was an out-and-out conveyance, and the soil was therefore vested in the defendants. The plaintiffs, therefore, had no right to take their wires over the road, and the application for an injunction failed.

Clifford's Inn.—In the Court of Appeal last week Lord Justice Cozens-Hardy's decision was upheld that Clifford's Inn, behind St. Dunstan's Church, Fleet Street, had been dedicated to public or charitable purposes and could not therefore be disposed of by the present sixteen members of the Inn.

"Cherrycroft," Forest Row, Sussex.—The architect of these buildings is Mr. E. W. Marshall. A somewhat similar house by Mr. Marshall—"Tanglewood," Godstone—was illustrated in *THE BUILDERS' JOURNAL* for January 1st last.

ARCHITECTURAL ASSOCIATION.

THE VILLAGES OF PORT SUNLIGHT AND THORNTON HOUGH.

By W. H. LEVER.

A MEETING of the Architectural Association was held on Friday evening last at 9, Conduit Street, W., the president, Mr. W. Howard Seth-Smith, occupying the chair. After the minutes of the last meeting had been read and confirmed, Messrs. A. W. Heath (London S.E.), R. D. Wells (London, W.) and C. H. Wheeler (London, S.E.) were elected members of the Association. The president then announced the following additional donations to the New Premises Fund:—

	£	s.	d.
C. E. Bateman	-	-	5 5 0
N. F. Barwell	-	-	4 4 0
W. J. N. Millard	-	-	2 2 0
D. T. Fyfe	-	-	1 1 0

Donations previously announced 12 12 0
3,944 15 6

Total £3,957 7 6

Some donations to the library were announced and Mr. W. H. Lever then read his paper on "The Villages of Port Sunlight and Thornton Hough." He said:—

The history of Port Sunlight is soon told. Our works were started in Warrington in January, 1886, and in the autumn of 1887, the site being found to be too small for our rapidly-growing business, it was decided that the best course would be to remove entirely to some rural district where ample acreage could be secured adjacent to both rail and water transport, with reasonable facilities for obtaining the necessary supply of labour. Rightly or wrongly, the River Mersey was selected as the best for our business, the land chosen being on the Bromborough Pool, situated about five miles from the centre of Birkenhead and about seven miles across the river from Liverpool Town Hall. Our first purchases were about fifty-six acres of land, of which twenty-four were intended for the business and works and thirty-two for the village. From time to time the area was added to by purchase as opportunity offered, until to-day the area is 230 acres, of which about ninety acres are devoted to the business and 140 to the village. The ninety acres devoted to the business are of no interest to us now, and therefore we will confine our attention to the village.

The ravines or gutters, up which to a greater or less extent the tide used formerly to flow, we have filled up and levelled the land at the bottom of the ravines, but only so as to raise it above high-water mark. This leaves the ravines available for use as parks and recreation grounds, and so treated they will become the feature of the village. At the junction with Bromborough Pool a dam is in course of construction, which will cut these parks off from the incoming tides and also serve to carry a road at that point across the pool. The roads have been so planned that whilst making direct and shortest ways to important points, they shall still form wherever possible curves and sweeps following the lines of the ravines. Another object aimed at in the laying-out of the village has been that none of the houses should have their backs to the railway line, a matter which is little thought of in laying-out building land adjoining railways, though I know of no feature that ought to have more careful attention.

Roads and Bridges.

The general width of the roads has been fixed at 40ft.—say, 8yds. roadway and 8ft. each for footpaths—but our widest road is 12yds. for road and 12ft. for footpaths. I don't know whether it is a recognised rule to make the footpaths as many feet wide as the roadways are yards in width, but I have always found this to give a most excellent proportion. In order to realise the intention of leaving the ravines as parks and recreation grounds, and at the same time not diverge from the directness of the roads to adjacent local centres, the ravines had to be spanned at several points, and with two exceptions where bridges have been built, this has been done by means of banks of earth. In building these bridges the intention has

been to add distinct objects of interest to the village.

The first of the two bridges is the one near the schools, spanning the park at that point. It was designed by Messrs. Douglas & Fordham, of Chester, and forms one of the most charming features of the village. The second bridge carries Bolton Road across the ravine to its continuation to New Chester Road. This bridge was built from the designs of Messrs. William & Segar Owen, of Warrington, and it would be difficult to imagine anything more solid and strong, yet light and graceful. It is an ideal structure for the purpose for which it was designed. At the time the bridge was built we did not own and could not then readily acquire the land bounding the north-western buttresses of the bridge. The ravine, therefore, for many reasons, could not be spanned by an embankment.

The Open-Air Theatre and Swimming Bath.

The total area occupied by ravines is 121,000 sq. yds., or about 25 acres. Adjoining one of these ravines we are erecting a gymnasium, using wood as the building material. In another we are erecting an open-air theatre, which for want of a better name will be called the auditorium. The sloping banks of the ravine allow of a perfect arrangement of seats somewhat on the lines of the classic Greek theatres. Of course I know it is somewhat risky to build an open-air theatre in this uncertain climate, but the view taken is this, that we may possibly rely on four months during which we shall find this theatre extremely useful; and as the cost of such an open-air theatre is certainly not more than one quarter that of a fully-enclosed building, it appears to be a fairly economical arrangement. In addition, is it not desirable to cultivate more the capacity of our English climate for open-air summer amusement? However, in any case it will be an interesting experiment. Adjoining another of the ravines and occupying a triangular piece of ground that otherwise could not have been profitably used, an open-air swimming bath has been made. The shape of the bath is oval—length, 100ft.; breadth 75ft.; 3ft. deep at one end and 7ft. 4in. at the other; with wooden dressing-rooms placed in convenient positions.

Gladstone Hall.

What I may call the first public building to be erected at Port Sunlight was the Gladstone Hall, opened by the late Right Hon. W. E. Gladstone in November, 1891. This, in my unprofessional opinion, is the most appropriate village hall we have. It has for long been too small for the needs of the village, and therefore an additional dining-hall has been built, at present devoted entirely to the use of the women and girls of the works and village. This hall is called

Hulme Hall,

and was designed by Messrs. William & Segar Owen, of Warrington, than whom no one has been more happy in their work at Port Sunlight, to whom also we are indebted for the quiet grace and beauty of the earliest buildings in the village which have given to it its distinctive English village character. Probably the difficulties connected with the size of Hulme Hall were greater than appear at first sight, the problem being to provide dining accommodation for not fewer than 1,500 people seated at small tables—say six persons at each table. The effect produced on one's mind by Hulme Hall is not that of a village building, but rather as showing what can be done with unlimited money lavishly spent, which is perhaps the least useful lesson village architecture should teach. However, the hall answers its purpose most admirably, and should prove to be a centre of life for the village as long as the village is in existence. The cooking arrangements are most admirable and perfect.

The Village Post- and Telegraph-Office.

At about the same time that we built the Gladstone Hall we built a block of cottages, with a shop at one end of the block. This shop is now used as the village post- and telegraph-office and is well worth attention. The half-timber work in it is solid oak, employed, as nearly as the modern Building Acts will allow, in exactly the same way as it would have been employed had the shop been erected 300 years ago. The same remark applies practically to

all the half-timber buildings at Port Sunlight, although there are, I think, one or perhaps two cases where this has not been strictly adhered to. The village stores used to be at this shop, but the growth of the village soon rendered it too small, and therefore large central shops were built from the designs of Messrs. Douglas & Fordham, of Chester. These are managed by the employees themselves entirely, and whatever capital is employed is provided by themselves, and whatever profits are made are divided amongst themselves.

Over the entire area of the three shops is

The Girls' Institute.

with large central hall and side classrooms, the latter formed by movable wooden screens, so that when required they can be thrown into the central hall. This is the girls' club of the village, and one of our most useful institutions: though it does not quite correspond to the Men's Social Club, being a more educational institution than the men's club. This latter was built from the designs of Messrs. Grayson & Ould, of Liverpool, and has proved a most useful and successful building for its intended purpose. It contains the usual accommodation for billiards, games, reading, &c., inside, with a full-sized bowling green adjoining. Opposite the men's club is a range of buildings with a "past." Its present use is as an addition to the school accommodation of the village. Its original use was to provide a series of four homes for girls, but these never attracted more than a dozen girls at one time, and finally they had to be closed and adapted for other uses.

The School Buildings.

But the buildings of which we are most proud at Port Sunlight, both architecturally and otherwise, are the school buildings, built from the designs of Messrs. Douglas & Fordham. All the social work of the village centres round these buildings. Additional schools are now in process of building from the designs of Messrs. Grayson & Ould, which, when completed, will raise the school accommodation to a provision for over 1,500 scholars. A church is also being built from designs by Messrs. William & Segar Owen. In building itself the aim has been to produce an honest piece of work, worthy of the purpose for which it is intended, with every detail, both inside and outside, speaking of thoroughness and truth, and with such ornament only as would add dignity to the building and produce a feeling of reverence in those worshipping within or viewing it from without.

The Village Inn.

I must not forget to take you to our village inn—called Bridge Inn—built from the designs of Messrs. Grayson & Ould. It is unlicensed, and it is not intended to apply for a licence for the sale of intoxicants. The inn is one of our most successful and useful buildings, providing easily day accommodation for many hundreds of visitors, with a few bedrooms sufficient to meet all the demands of visitors requiring to make a longer stay in the village. Considering the difficulties to be overcome in securing all that was demanded of the architects at a cost within the means placed at their disposal, this is certainly one of the successes of the village.

And now, before leaving Port Sunlight and proceeding to the little village of Thornton Hough, let us examine the various types of cottages built at Port Sunlight. We have really two standard types only—the cottage and the parlour house—although we have about half a dozen cottages which have less accommodation than the standard type of cottage, and perhaps a dozen larger houses, occupied by our clergyman, doctor, schoolmaster, managers and heads of departments, which, however, present no special variation from the usual villa or moderate-sized family house.

Standard Type of Cottage.

We will, therefore, pass these exceptions over, and devote ourselves to the consideration of the standard type, which really is the type for 97 out of every 100 houses. In planning the standard type the idea has been, firstly, to provide a garden as foreground to the cottage and screen from the road. These front gardens are in every case kept in proper order and cared for by ourselves. We have found by experience that no other plan is successful in securing a character to the village and avoiding the

unsightliness of here and there the obtrusion of neglected plots of garden which would mar the whole effect. This care by ourselves of front gardens is effected at a cost of 3d. per garden per week. In addition to these front gardens we have also allotment gardens to almost each block of cottages. These allotments the tenants cultivate themselves as vegetable gardens, or properly fence and use for poultry, &c. These allotment gardens are placed as near as possible to each cottage and are the very safety-valve of the village.

The accommodation in the cottage type provides for three bedrooms upstairs, and living-room, kitchen, scullery, bathroom and larder on the ground-floor, with enclosed yard and usual outbuildings. Our experience leads us to believe that any variation from dimensions chosen has not been popular with the villagers. If the rooms are made larger it entails more work on the wife than she is able to devote to their care, and therefore the house soon loses its tenant. On the other hand, if the rooms are smaller they will not accommodate the necessary furniture, with a like result. In fact, a workman's cottage must fit like a glove the wants of a tenant if it is to be a successful attempt to provide for the happiness and comfort of himself, wife and family. Having settled by experience the most suitable type of cottage, it has been adhered to in all the cottages at Port Sunlight and Thornton.

The parlour cottages differ from the ordinary cottages in having an additional bedroom on the first floor and a parlour on the ground floor. In a few cases the scullery in these houses has been fitted with a kitchen grate, so that all the cooking could be done there, leaving the kitchen to be used as a dining-room. The general type adopted for the parlour houses has proved popular, and therefore has been settled upon as permanent.

The Financial Aspect

of the village at Port Sunlight is soon told. The capital it has taken to buy the 140 acres of land, build the cottages, houses, schools, shops, institutions, clubs, &c., and including making the roads, laying-out the parks, &c., has exceeded £350,000. Our standard type of cottage thirteen years ago cost us £200 each to build, and identically the same cottage in 1901 cost us £330 to build. The parlour houses cost us then about £350 each to build and now about £550 each. Upon this £350,000 Lever Brothers, Ltd., receive no interest or return whatever, the rents being fixed at such an amount as only to pay for rates, taxes, repairs and maintenance. The rents have had to be increased from 3s. per cottage per week to 5s. per cottage per week owing to increased cost of maintenance of parks and roads and of the cottages themselves. The cost of repairs has gradually grown to extravagant proportions owing to the fact that every tenant has been allowed practically any repairs he asked for. This was allowed because the tenants as a whole paid the total cost of repairs and maintenance, but this system does not bring it so clearly home to individual tenants that extravagance in requests for skilled workmen for trivial repairs is expensive. There are clear indications shown by the reduction in the number of such requests during the last six months that the last raising of the rents is having a good effect. From our experience, therefore, it appears that with the most economical expenditure on repairs and maintenance the rental of a cottage to cover rates, taxes, repairs and maintenance would be 3s. 6d. per week and of a parlour house 5s. 6d. per week, and that out of such rental nothing would be available as interest on capital outlay.

Return in Percentages.

Taking the value of the land at £240 per acre, and taking ten cottages per acre as the maximum number possible per acre, after allowing the proportion of each cottage for parks and recreation grounds, we should have a total cost for cottage and land of £354, which at 4 per cent. interest and 1 per cent. depreciation (in addition to cost of maintenance already provided for) is, say, £17 14s. per cottage per annum, or say 6s. 10d. per cottage per week. Adding this to the cost of rates, taxes, repairs and maintenance, we have a rental of 10s. 4d. per cottage per week as the letting value of the cottages of Port Sunlight on an ordinary commercial basis. Taking the rate of interest at 3 per cent. and of depreciation at $\frac{1}{2}$ per cent.,

the sum of 4s. 9d. per cottage per week would be sufficient to meet these, and consequently a gross rental of 8s. 3d. per cottage per week would be sufficient.

A Commercial Impossibility.

My object in mentioning this is to draw attention to the fact that to build a village such as Port Sunlight is not commercially possible at the present time. To ask either of the above rents would be to place the possibility of living in such a village out of the reach of ordinary village tenants. How can the difficulty be met? There are only two possible channels of reduction—cheaper land and less expensive buildings. The value of the land for cottages is fixed by the number of cottages the law allows to be built upon it. If the legal maximum were twelve cottages per acre, as it ought to be, it would be impossible for land for cottages to reach a higher value than twelve cottages would bear. The present Building Acts allow of forty-five cottages being crushed like sardines in a box on one acre of land. The effect of this absence of proper restrictions operates in all cases to the raising of the value of the land. In Liverpool this is seen by competitions amongst builders themselves, who elevate to the level of a fine art the study of how many cottages can be squeezed upon a given area. The ingenious builder who can see his way to squeeze the most houses on a given plot of land sees his way at the same time to give the highest price for the land and so to secure it. The only remedy is the restriction of the number of cottages to be built upon a given area of land—to, say, twelve cottages per acre. This will allow 400yds. of land for cottage and garden, and proportion of roads and open spaces for parks and recreation grounds. This is the maximum limit possible for maintenance of healthy life. A limit of ten cottages per acre, or 480yds. per cottage would be better.

Cost of Building.

The next consideration is the cost of building, and I venture to suggest that there is here a magnificent field awaiting the attention of our best architects. This subject should not be left to the unaided efforts of what we often thoughtlessly call the jerry-builder, a man who is in my opinion a most useful member of society—more sinned against than sinning. The so-called jerry-builder has to make the most of an almost impossible position—to satisfy the demands of the public for cheap dwellings, regardless of consequences—and I maintain that, building upon dear land, he does all that can be done with the materials at his disposal. If our best architects would only come to his assistance by studying the present-day requirements to be provided for in dwelling-houses, the cheapest and best materials for the purpose, the preparation of the same by machinery, as far as possible, rather than by hand-labour; to study the saving to be effected by the erection of dwelling-houses in large masses rather than singly, and to do so with greater effect and less monotony than by building as at present; in fact, to raise architecture in relation to the dwellings of the million on to broad comprehensive lines, so as to rest on the only true basis that architecture can ever occupy—the supplying of the requirements of the age with economy, simplicity and character. Modern domestic architecture requires to adapt itself to the requirements of the twentieth century in the same way that naval architecture has done in shipbuilding, and to accomplish as much by disregarding traditions as to building materials in supplying the demand for dwellings for the masses of the people as naval architecture has done by disregarding traditions as to shipbuilding materials in supplying our present-day demands for ships.

Cottages to Last Fifty Years.

We know that for certain buildings which must be monumental and important we are not likely to discover better building materials than stone, granite or marble. But dwellings for the masses of the people need not be monumental. If they can be inexpensively built to stand absolutely sound, weather-proof and sanitary for, say, fifty or sixty years, they will better supply the present-day requirements than if by increased cost they were built to

stand good for 300 years. The changing life of our citizens, the necessity that is laid upon them to follow their employment wherever it may lead them, and the fact that our experience teaches us that in fifty or sixty years the site of cottages may in all probability be wanted for other purposes—all point to the present-day requirements in cottages being not for cottages to stand hundreds of years, but tens. Understand I am not speaking of the building of villas or mansions, say, from £70 a year rent and upwards. I only refer to cottages and what for want of a better word I may call "parlour houses," the rentals being from a few shillings a week to say £30 or £40 a year. I know of no greater service the architects of the country could perform during the new century than the designing of such economical cottages and small houses to endure for fifty or sixty years only.

We will now pay a short visit to

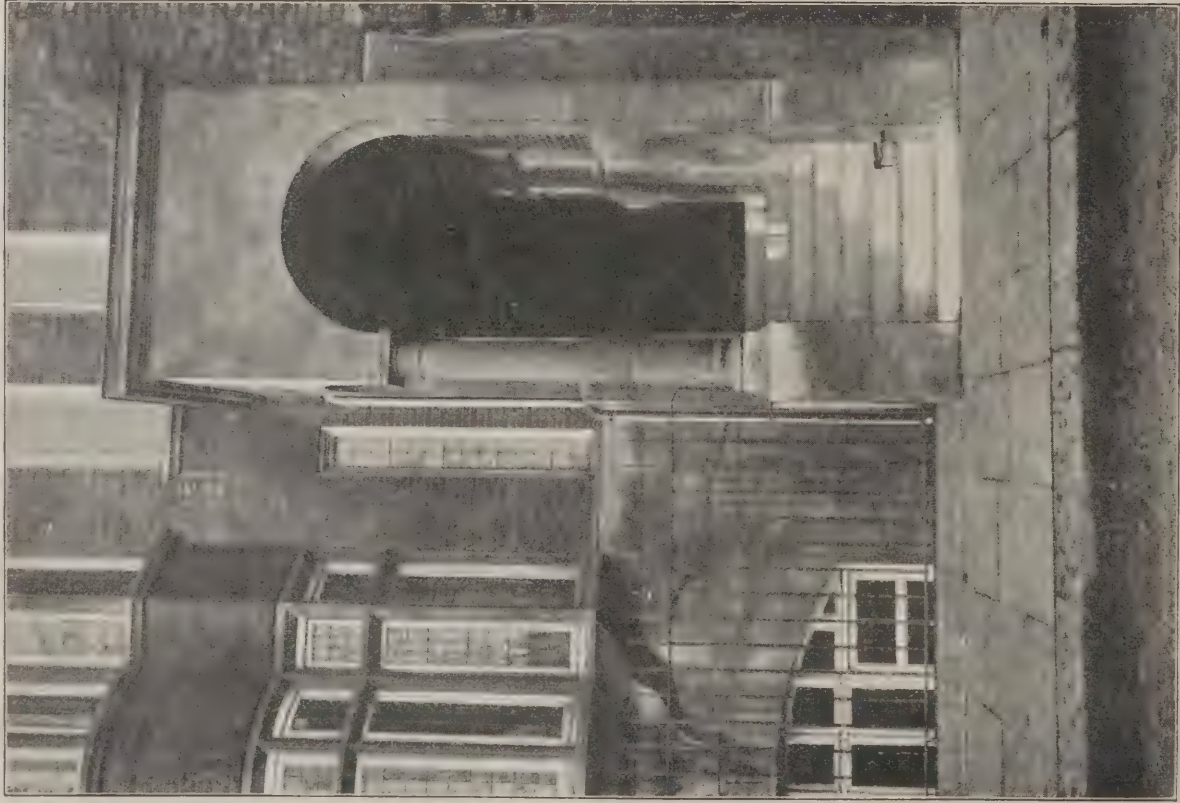
The Village of Thornton Hough.

Here the problem was not how to build an entirely new village, but how to rebuild an old one. The exterior of some of the old cottages in the village were very picturesque when seen in fine weather, but unfortunately the more picturesque the exterior appearance the more dirty, dark, damp, unhealthy and at variance with all ideas of common decency was the interior. The villagers in many instances, but not every one, were attached to these old ruins, one tenant remarking: "If yer touch the roof ye'll push the walls out, and if yer touch the walls ye'll have the roof down." However, all difficulties in the end were overcome. Only the irreclaimable cottages were pulled down and new cottages built in their place. Cottages offering the slightest possibility of reformation were altered, repaired and adapted to modern requirements. The new cottages were not always built on the site of those pulled down, but as far as possible this was done so as to preserve the general outline of the village. A score or more of additional cottages have been added to the village to supply the growing need of the agricultural and farm labourers of the parish. I have confined the tenancy of the cottages to the village labourers, and in consequence have only about 1 per cent. of direct return on the investment. I have, however, the satisfaction of knowing—if that is any satisfaction—that under present building possibilities, however "jerry" and however plain and ugly I might have built, at the rentals which village labourers can afford to pay the result as an investment would have been little different. Messrs. William & Segar Owen, of Warrington; Grayson & Ould, of Liverpool; and Douglas & Fordham, of Chester, are the architects I was fortunate enough to secure to design and carry out the work. The same general plan or type of cottage has been adopted at Thornton as at Port Sunlight, and the same provision for gardens and recreation grounds has been made.

Some Early Reminiscences.

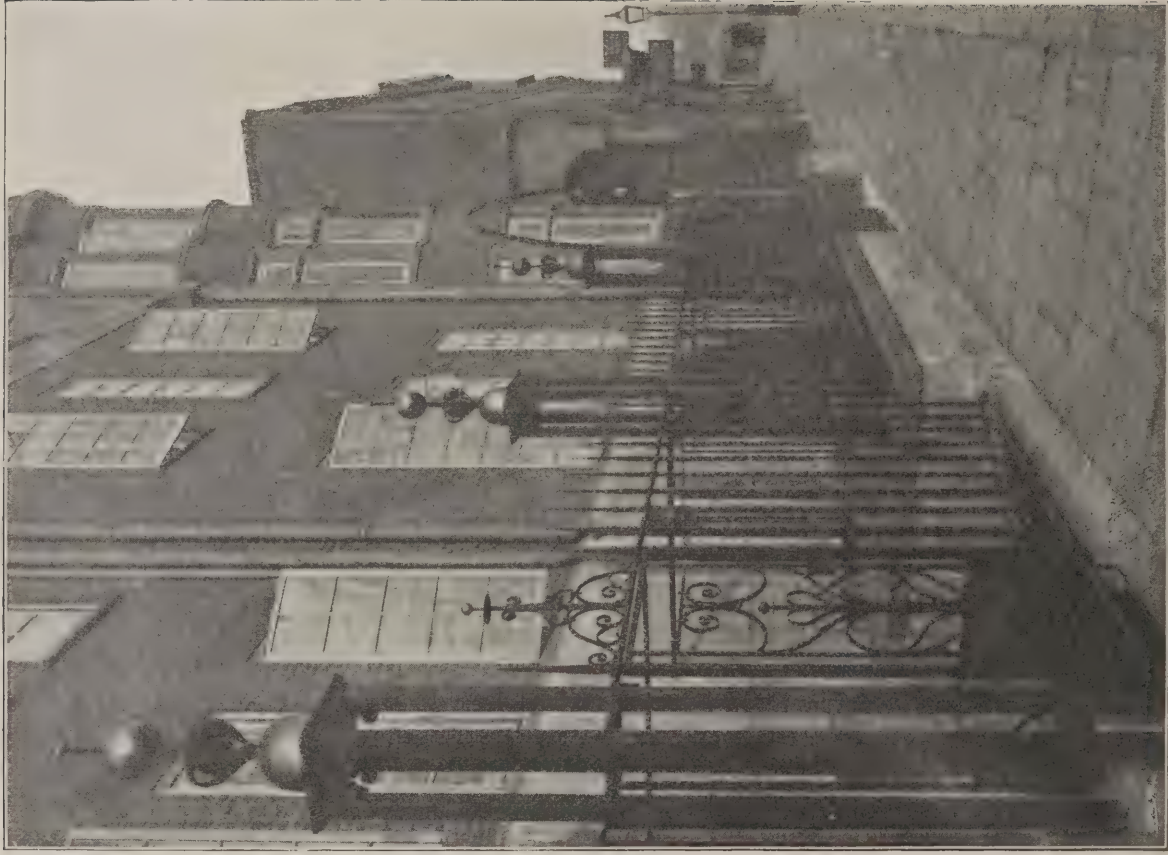
And now allow me to explain, in order that you may understand my position and work better, that I have always wished that I had been an architect. I have been building since when, at nine years of age, a lean-to rabbit hutch absorbed all my spare time for that year. The following year this rabbit-hutch appeared to be capable of extension, and it was pulled down and rebuilt on a more extensive scale, allowing a number of small boys to stand upright inside the hutch. The third year saw a further development in carrying out a startling idea, that of covering the roof with soil to the depth of about 6in. and planting oats therein with the object of raising food for the ever-increasing stock of rabbits. But, alas! "the best laid plans of mice and men gang aft agley," to say nothing of those of architects and builders; for although the corn grew luxuriantly in the early spring, it all withered away in the summer heat, and so this economy of space, which had it proved practicable might have done so much for distressed agriculture, had to be abandoned. Nothing discouraged as far as my building instincts were concerned the year following I built a pigeon-cote, and so on, each and every year finding me engaged in some building operation, right up to the present time.

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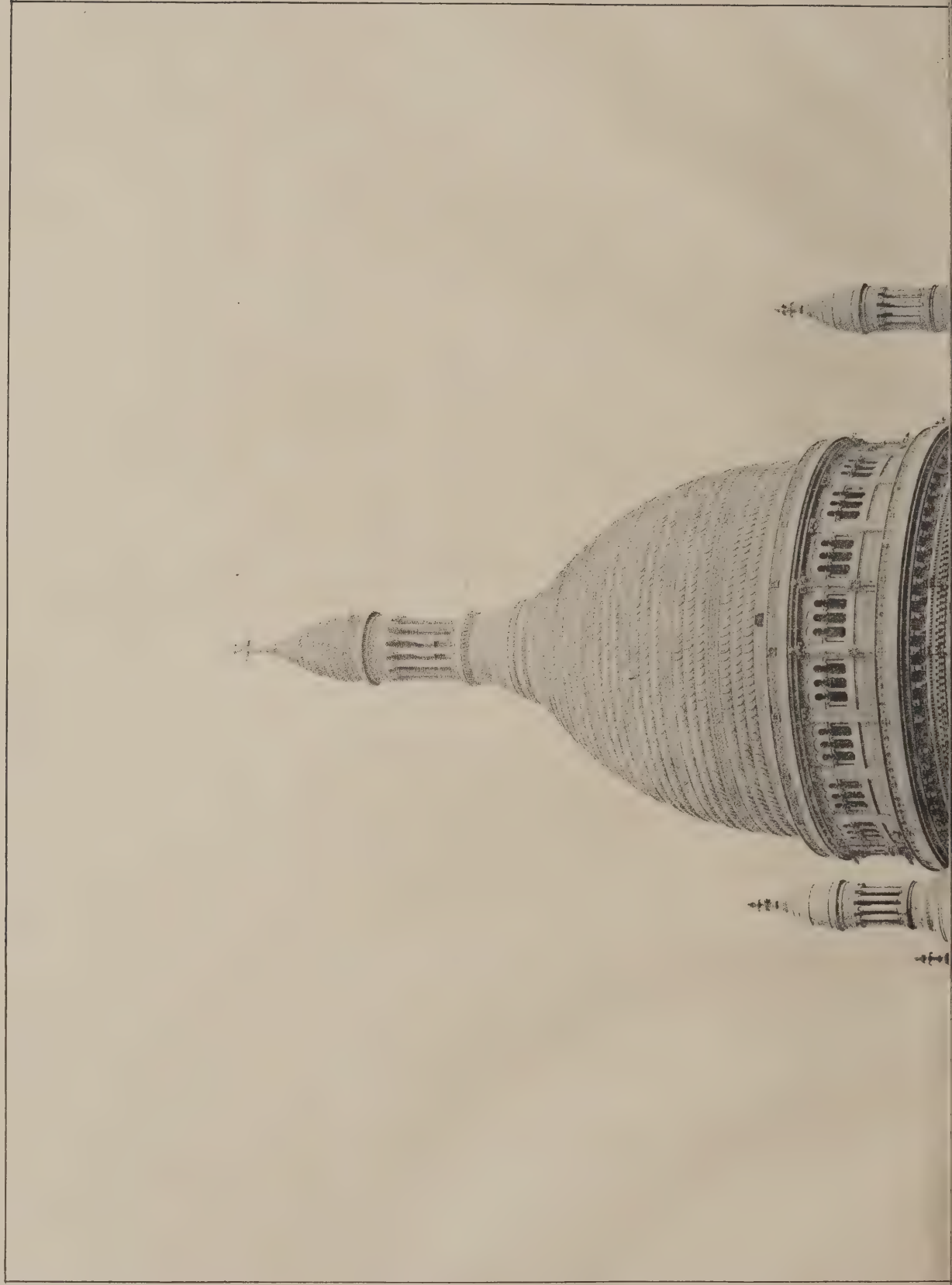
C. R. ASHBEE, Architect.

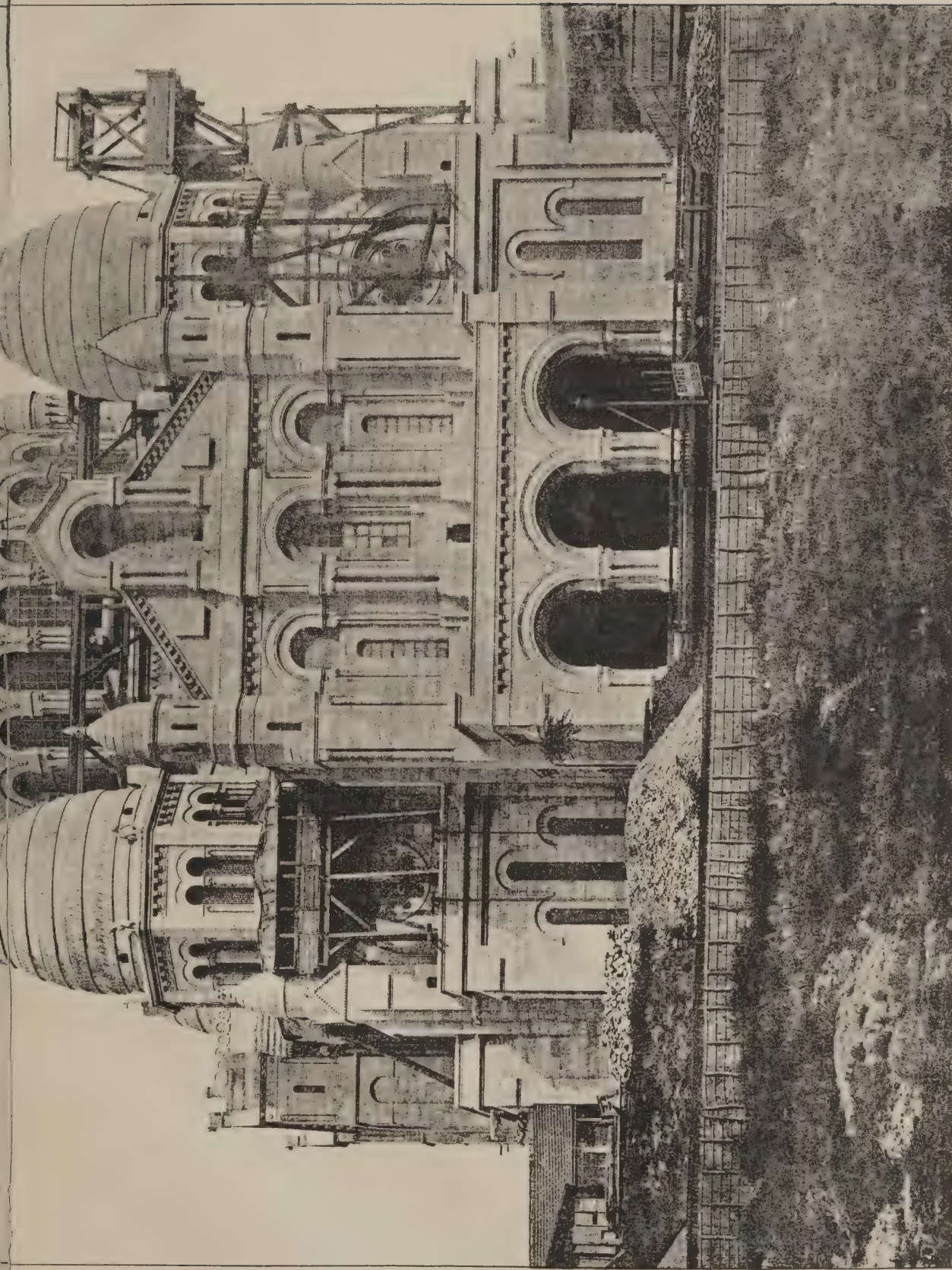


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*Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, March 26th, 1902.*



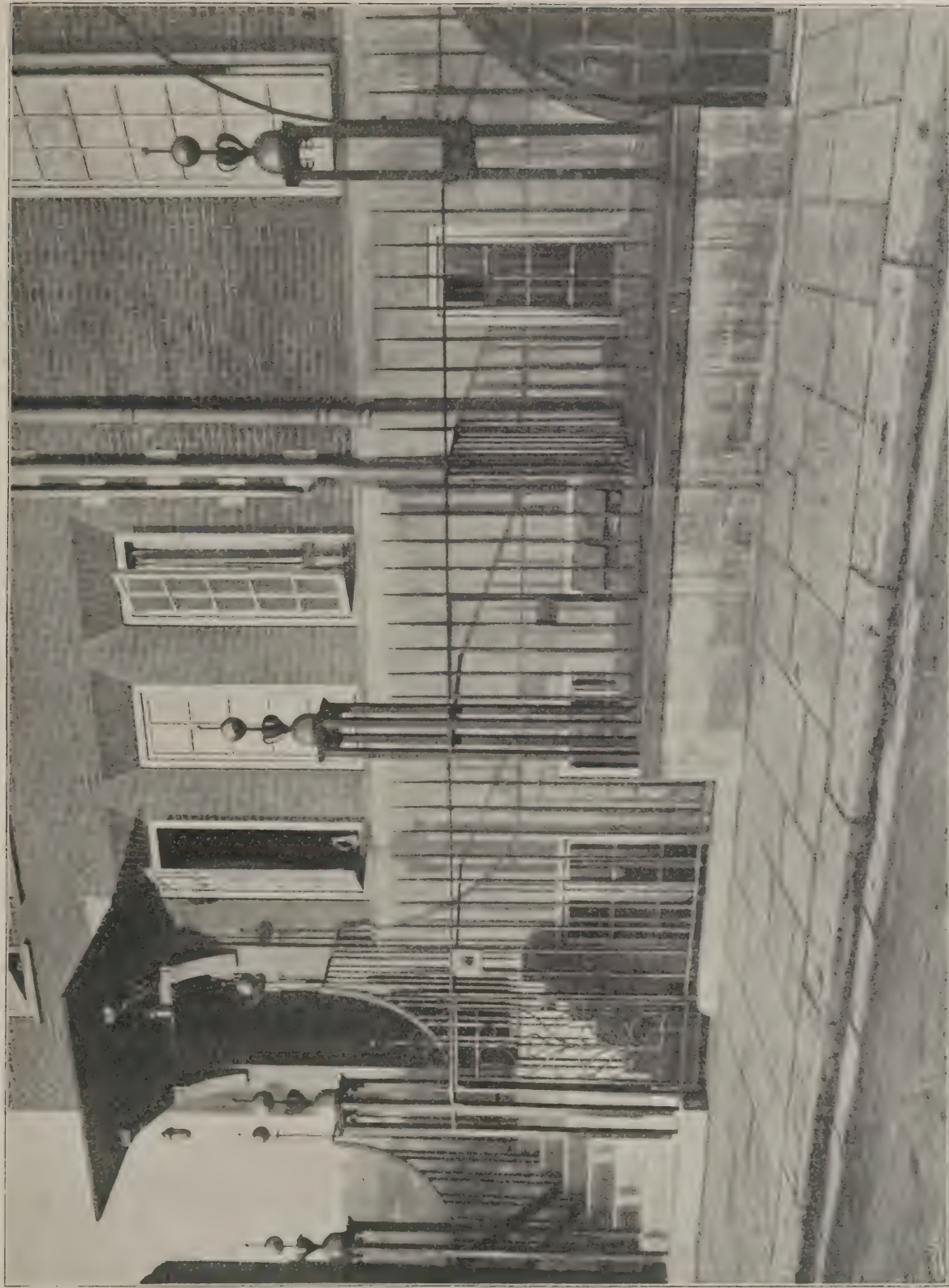


"INK-PHOTO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

CHURCH OF THE SACRED HEART. MONTMARTRE, PARIS.

PAUL ABADIE, Architect. In course of completion by HENRI RAULINE, Architect.

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No. 39, CHEYNE WALK, CHELSEA, LONDON. C. R. ASHBEI, Architect.

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Gentlemen, there is no career that opens up such immense possibilities for influencing the world in which we live as that of the architect, and yet architecture is one of the least remunerative of the professions. Why it should be so I fail to see, yet it does appear to me from my own observation that, attention once directed to money-making as an aim and object, art vanishes. No, if money-making is to be the aim and ambition of life, then architecture is not the calling to follow. But money-making is not the highest object of life, but service to our fellow-men, and in my humble opinion an architect's career is one of the most serviceable in the whole range of honourable callings.

The Discussion.

In reply to questions Mr. Lever said:—As to the birth and death rates at Port Sunlight, these are respectively 56 and 10 per thousand, the one being double and the other half that for the United Kingdom. This is in measure due to the fact that the villagers are mostly young people, but it is important to note that the infant mortality is very small—which speaks much for the healthiness of the village. I have a great objection to a long view of backs of houses and therefore the corners of the streets have been turned. This contravenes the by-laws and the plans were sent back: but I told the authorities I had decided to build according to my plans, and they could take what action they liked. As regards the effect of trades-unionism, we pay a high rate of wage and find it best to do so: for we thus obtain a better selection of men. As to railway companies acquiring land for housing purposes when laying down new lines, I am not a believer in them. The Lancashire and Yorkshire Railway Co. had works at Barry and Miles Platting: these became too small, and a farm near Manchester of 200 acres was bought by proxy at £50 an acre; but the company erected their new works in exactly the same unsatisfactory condition as the old ones; so that after work the employees even preferred to go home to the former district. At Port Sunlight the wages average from 20s. to 50s. a week. Nobody who earns less than 25s. can have a cottage costing more than about 4s. 3d. a week, while those earning higher wages can rent the "parlour houses" at about 5s. 6d. a week. When we first started the land cost £200 an acre, now it costs £500 and more. With one exception all the institutions are entirely under the control of the villagers. Thornton Hough is purely agricultural.

The president announced that a special meeting of the Association would be held on Friday, April 4th, to consider the amendment of by-laws.

Builders' Notes.

Mr. John Hodge, builder, of Clinton Road, Redruth, died recently at the age of sixty-six.

Mr. John Kay, a master-joiner and builder, of Heywood, died last week at the age of sixty-one years.

London County Council.—At last week's meeting of the Council a report was submitted by the General Purposes Committee dealing with the formation of a new Works Committee, who shall be responsible for the management of the Works Department. It was recommended that the Committee should consist of seven persons. Mr. W. Peel, M.P., said he noticed it was proposed to keep separate accounts in such a manner as to show the cost of each job. If that had been done in the past they could have told how many bricks per day had been laid. After discussion, the recommendations were adopted. The Council then proceeded to deal with an urgency report of the Committee recommending that the following form the Works Committee:—Lord Welby, Messrs. W. Bruce, E. A. Cornwall, L. Sharp, E. Smith, A. M. Torrance and D. Waterlow. This Committee was eventually agreed to.—The Council approved the estimate of £14,250 required for widening Old Street to about 60ft.—It was agreed "that, taking into consideration the long distance between Battersea and Wandsworth Bridges, it be referred to the Bridges Committee to consider and report as to the advisability of providing direct means of communication between Fulham and Battersea."

Bricks and Mortar.

APHORISM FOR THE WEEK.

*If Art be, in truth, the higher life,
You need the lower life to stand upon,
In order to reach up into that higher.*
MRS. BROWNING.

Our Plates. A DESCRIPTION of the Church of the Sacred Heart, Paris, appears on p. 82 of this issue, on which page also some particulars are given of the houses in Cheyne Walk designed by Mr. C. R. Ashbee.

Speyer Cathedral. ARRANGEMENTS are being made for carrying out the restoration of the tombs of the old German Emperors in the cathedral at Speyer, the Bavarian Parliament having granted 120,000 marks for the purpose. In the new vault below the so-called King's Choir bronze tablets will be affixed to the walls bearing the names of the persons here buried. Above the King's Choir there will be an Imperial crown of gilded copper, a cross and twelve hanging lamps. The destruction of the Imperial tombs by the French in 1689 was not so complete as is sometimes supposed. They opened and destroyed, however, four tombs. The other tombs they did not touch. It has now been found possible to separate the remains found in the destroyed tombs and amidst the *débris*. The remains of the Empresses Bertha and Gisela and of the Emperors Conrad II., Henry III. and Henry IV. are now resting in their original stone sarcophagi; while those of Henry V., Beatrice, Agnes, Philip of Suabia, Rudolph of Hapsburg, Albert of Austria and Adolph of Nassau are carefully preserved in temporary wooden coffins in the Cathedral Sacristy. The excavated space beneath the King's Choir has been covered temporarily with wooden planks. The bodies will ultimately be buried either in the original or models of the original coffins of metal, which are to be placed in stone sarcophagi and deposited in the vault beneath the King's Choir.

South Shields Municipal Buildings Competition.

THE report of the Municipal Buildings Special Committee on the further plans which have been prepared by the six architects selected to compete for the new award has been approved by the South Shields Town Council. The original designs were based upon a limited cost of £25,000, which sum was subsequently considered inadequate for a pile of buildings on such a magnificent site as Ogle Terrace. It was therefore decided to ask the six best competitors to send in new designs based upon an expenditure of £35,000. The Committee report that these designs were submitted to the adjudication of Mr. J. Belcher on the 19th of February and his report was read on March 5th. He states that the six sets of revised designs have all been carefully worked out in compliance with the conditions and fully justify the selection made for the second competition. He had no hesitation in placing first the design marked No. 2. It was an admirably-arranged plan, and the several departments were conveniently placed. The cost of this design, taken throughout at 1s. 2d. per ft., have been placed by the author at £35,000, but on the cubic capacity furnished by the borough surveyor it amounts actually to £31,875 nett, this cost being considerably less than any of the other five works, none of which could be executed for the sum stipulated. The Council has decided to adopt Mr. Belcher's selection; and on the envelope being opened the name of the author of design No. 2 was found to be Mr. Ernest E. Fetch, A.R.I.B.A., of London. Mr. Fetch won the award in the first competition.

The Discoveries at Greenwich.

RECENT searches in Greenwich Park have resulted in unearthing the floor of a Roman room, the greater portion with the tesserae intact. Mr. A. D. Webster, the superintendent of the park, considers that the remains advance a theory which he has long contended for—that the Roman road from London to Dover ran through Greenwich Park instead of Blackheath, as has been generally accepted. The evidence was now strengthened that the historic road

passed through the park and Silver Street, thence through Deptford. The floor was unearthed about 2ft. below the surface, and under careful treatment the work in cubes of red tile was exposed to view. Other finds which lend additional interest to the excavations consist of a collection of coins apparently of the periods of Hadrian and Constantine, and of pieces of figured pottery and ornamental wall-plaster. The places where the excavations have been made—which are situated on the crest of the hill to the west of the Observatory and on the Blackheath side of the Royal Park—have been fenced round.

The Turin Decorative Art Exhibition.

MR. WALTER CRANE and Mr. Edward S. Prior state that the English section of the International Decorative Art Exhibition at Turin, which opens in April next, will by invitation of the Turin Committee consist of (i.) a special exhibition of the Arts and Crafts Exhibition Society, as a society, and (ii.) a collection of the works of Walter Crane. There will be also an industrial British section and a Scottish artistic section. It was desired by the Turin authorities to have also an exhibition of the work of the students of the British schools of art, but as our Government were not able to grant any money towards the expenses this project had to be given up. The collective exhibit of the Society is the feature to which they wish to call attention, this exhibit including most of the artists, both members and non-members of the Society, who have exhibited at their London exhibitions. By the courtesy of the authorities of the Board of Education and of the Victoria and Albert Museum, and of others, they have been able to send some works of William Morris, which were specially desired by the Turin authorities, as well as the examples of living artists.

St. Peter's, Colchester.

ANOTHER step towards the restoration of St. Peter's Church, Colchester, has been effected by the renovation of the chancel, which completes another section of the general scheme sanctioned in 1894. The walls of the chancel have been raised and a Perpendicular window, glazed with cathedral tinted glass, now fills the space previously occupied by the remains of an old window and the picture formerly fixed on the gable wall. The old ceiling, too, has been replaced by an open timber roof with moulded ribs. The communion rails have been moved eastwards and clergy desks placed under the chancel arch. The floor is to be paved with red and grey Devonshire marble, with a marble step at the communion rails. The space under the window has been filled in with oak panelling, similar to that on the north and south walls of the chancel, a suitably carved panel being placed in the centre. The chancel will in future be illuminated with the electric light. The total cost of the work will be about £570.

A Ruskin Memorial.

MR. J. HOWARD WHITEHOUSE, hon. secretary to the Ruskin Memorial Committee, says that since the death of Mr. Ruskin the council of the Ruskin Society of Birmingham has had under its consideration the question of promoting a memorial to him, and has now formed a national committee for the purpose of carrying out the following scheme:—It has been decided that the memorial shall take the form of a village library, art gallery and museum. The scheme has been placed before the trustees of the Bournville Village Trust, and they have presented free of all cost an adequate site for the memorial. It is therefore proposed to erect the memorial on this site, where it would be of use to the populous districts of Selly Oak, Stirchley and other places, which are at present wholly without any such institution. The memorial committee includes the Bishop of Ripon and the Dean of Ely. It is estimated that the cost of the building and its equipment will be about £10,000, and a further sum will be required for the purpose of endowment. The memorial committee invite the co-operation of all lovers of Ruskin in order to assist them in carrying the scheme into effect, and the hon. secretary will be pleased to receive subscriptions towards the memorial.

IRRATIONAL ANCIENT LIGHTS.*

THE LAW IN FOREIGN COUNTRIES.

By WALTER C. WILLIAMS, Solicitor.

I WILL not occupy your time with any preliminary remarks, but commence at once *in medias res* and say my contention and conviction are that the state of the law in England to-day with regard to rights of light is little if any short of an iniquity.

The Prescription Act (2 & 3 Will. IV., c. 71, s. 3) enacts: "That when access and use of light to and for any dwelling-house, workshop or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible, any local usage or custom to the contrary notwithstanding, unless it shall appear that the same was enjoyed by some consent or agreement expressly made for that purpose by deed or writing."

The result in practice is that, where two men own two contiguous plots of ground and one owner wants to build and does build at once and the other owner does not want to build, then, notwithstanding that he may have every intention of building eventually, if owner No. 2 postpones his operations for nineteen years he is unable to use his own land in accordance with his desire without being hampered by certain so-called rights his neighbour has acquired to access of light to his windows and other openings over No. 2's land. In effect, my neighbour can dictate to me at what period I am to build on my own land by building on his own.

Again, if both owners build simultaneously but A builds a higher or longer edifice, B, if he is ever to increase the size of his building, must do so within nineteen years of A's completion or be practically debarred from doing so altogether, regardless of whether B has any need or wish, or even whether he is able, to extend his premises within that time.

Now how can an owner prevent his neighbour acquiring a right of light over his land? In one way, and one way only, and that is *actual obstruction*.

He may protest in the most emphatic and solemn manner, but it avails him nothing; he may give notices, but they afford him no protection. No, wherever his neighbour has an opening in his building overlooking his land or buildings, he must erect a hoarding (should he not wish to build permanently) opposite to it. The hoarding may have to be 60ft. high and 500ft. long, may be a hideous eyesore to the surrounding property, may be a most oppressive, even ruinous, expense; but up it must go, and must be retained there for a full year, for section 4 provides that an interruption to be valid must be for one complete year. Hence, as soon as light has been enjoyed for nineteen years and one day there cannot be an interruption of one clear year before the expiration of twenty years from the time of its first enjoyment, though the owner cannot bring any action until the full twenty years have elapsed. It is obvious that in some cases this remedy may be as costly as the value of the land.

[Mr. Williams here proceeded to give a brief historical sketch of the cases constituting the law of ancient lights, and then quoted the dicta of several judges to prove that the law was in urgent need of reform.]

In conclusion I will refer to the laws of some other countries.

In Scotland our English rule has never been accepted. Erskine says in his "Principles of the Law of Scotland": "This servitude cannot be constituted by prescription alone, for though a proprietor should have built his house ever so low, or should not have built at all for forty

years together, he is presumed to have done so for his own convenience and profit, and therefore cannot be barred from afterwards building a house on his property or raising it to what height he pleases unless he be tied down by his own consent." Another writer says "The theory in Scots law is that a proprietor is only bound to provide light for his own property, and any open space he may have is not to be reckoned on by his neighbour."

In Ireland also a man had to provide his own light as well for his land. The Irish law, however, is now assimilated to our own by Lord Carew's Act in 1838.

In the U.S.A. in 1837, shortly after the Prescription Act was passed, an American judge—Judge Bronson—expresses himself thus: "There is, I think, no principle upon which the modern English doctrine on the subject of lights can be supported. It is an anomaly in the law, since the English doctrine of ancient lights has been repudiated in our courts. It cannot be applied in the growing cities and villages of this country without working most mischievous

Hence, we see another example of the isolation of our beloved country. Is there not only one remedy—legislation? I would suggest an enactment providing that no further rights of light across another's land should be acquired, and that existing rights should be extinguished (1) as to freehold, at the end of fifty years; (2) as to leasehold, at the expiration of fifty years, or the existing term, whichever period should be the shorter.

This would entail no hardship on anyone, would do an injustice to no one. The man who had built would still have all that he paid for, his land and the materials on it, and the owner of adjacent land would enjoy his own in his own way without being jeopardised by the operations of his neighbour. I can conceive some objection to this in the case of abnormally high buildings, but this might be easily provided for by giving the owner of an adjoining building over, say, 50ft. high, a right—which indeed I think he would have without special provision, under the maxim, *sic utere tuo ut alienum no laedas*—to compensation, not for obstruction to his light

per se, but for any general damage that might be actually proved in each case by appropriate evidence, as in suits to abate a nuisance.

At the foregoing meeting it was resolved to refer to the Council of the Society to take action for promoting some legislation to amend the existing law of ancient lights. Messrs. G. E. S. Streetfield (London, W.) and G. Ratcliffe (Norfolk) were elected members of the Society, and Mr. F. B. Holt (Warwick) was elected a student.

Views and Reviews.

The Use of Cement.

This is a very useful little book for cement users and buyers, containing an immense amount of information in a small compass. Some such note-book, small enough to go comfortably in the pocket, has been needed for many years. It is written in easy language, understandable by all. The book is divided into four sections. Section I. gives a short abstract of the history of cement-making and a description of the processes of manufacture, with a number of methods of testing. Section II. deals with the use of cement, what materials may or may not be employed with it, and hints as to methods of using it for different purposes, with proportions. Section III. explains how, when and where to buy cement. Section IV. gives a directory of cement-makers and a list of representative towns, and provides means for determining which firms are the most likely to be the cheapest to obtain cement from for any particular destination. As the author says: "Practically all the cement-makers in this country now make their cement on scientific lines; and it is so easy and cheap to test, or to have tested, any cement—the result of

such tests being absolutely reliable—that it is much better to buy on the test than on the brand." This gives clearly the need for knowledge of how to test and use cement, and for the general reader we cannot recommend a better book. It is admirably printed and got up, as all Messrs. E. & F. N. Spon's books are, being bound in thin leather, with gilt edges.

"Cement Users' and Buyers' Guide," by Calcare. London: E. & F. N. Spon, Ltd., 125, Strand, price 2s. 6d. nett.

Public Library at Milwaukee, Wisconsin, U.S.A.—An illustration of the reference-room in this library was published in *THE BUILDERS' JOURNAL* for September 18th, 1901. The building is referred to in the paper on the planning of American libraries read at the last meeting of the Royal Institute of British Architects and reported on p. 74 of our last issue, which paper is published in full, with plans, in the issue of the "Institute Journal" for March 22nd.



FIREPLACE IN BOARD ROOM, MILWAUKEE PUBLIC LIBRARY, U.S.A.
FERRY AND CLAS, ARCHITECTS.

consequences. It has never, I think, been deemed part of our law." And he then refers to Kent's Commentaries. "In 1893 the New York Court of Appeal held that an owner of property may place his windows overlooking his neighbour's premises, but the neighbour may build to the extremity of his land, nevertheless."

In France it is provided that a man may not have a straight view, or a window for sight, or balconies or other projections on his neighbour's estate unless there is a distance of 19 decimetres between the wall on which they are made and the said estate; nor a side or oblique view on the same estate, unless there is a distance of 6 decimetres. The Italian code is similar, but the distances are slightly less. Lower Canada maintains the French rule. In Sweden a man must not construct windows nearer than 7ft. 9in. to his neighbour's land.

So you see in none of these countries can a man rely on his neighbour for his light, but must make suitable provision for himself.

* Summary of a paper read before the Society of Architects on March 20th, 1902.

IDEAL PLUMBING.—III.

By G. A. ALLAN, Plumbing Instructor, Trades Training School.

(Continued from p. 42, No. 369.)

THE most important fitting in connection with sanitary drainage is undoubtedly the water-closet. The only patterns that should be allowed on any jobs are the wash-down (Fig. 14), the valve (Fig. 15) and the syphonic (Fig. 16); and of these only the best makes are permissible. Plug valves, plunger closets, wash-outs, long and short hoppers, and cottage pans should be classed with the much-condemned pan-closet and rigorously excluded from all sanitary work; while latrines, trough-closets and similar fixtures would never be allowed by any self-respecting architect, nor fixed by any sanitary engineer who valued his reputation. Valve and syphonic closets require a trap to be fixed under the floor. The soil-pipe can be tested for soundness before the closets are fixed by stopping the inlets to the traps; P-traps should always be used for these closets. When they are connected to the soil-pipe the branch of the latter and the trap are fixed between the floor of the closet and the ceiling of the room or passage below; therefore, the P-trap is necessary. When connected directly to the drain, the trap being underground, a P-trap should also be used, the out-go being turned towards its junction with the drain. Wash-down closets, when connected to the soil-pipe, should have P-traps, as all the joints are thus kept above the floor, where they can be seen, until the pipe passes through the wall to the open air. Wash-down closets connected directly to the drain usually have S-traps, as it is necessary to lead the out-go underground at once. Wash-down closets should be of the pedestal form, having the pan and trap made in one piece. They should be fixed before the soil-pipe is tested, so as to ensure the soundness of the connection between the trap and the soil-pipe. This joint can be seen and examined, but every joint that has drain-air inside it should be tested.

I attended a "demonstration to students" at the Parkes Museum of Hygiene one evening, and went directly afterwards to a lecture on plumbing. Curiously enough, the subject of both lectures was "Water-closets." The first demonstrated the superiority of the wash-down closet over all other types, especially over the valve closet. Its simplicity, the absence of complicated machinery and hidden parts, its cleanliness, compactness and safety were all duly dwelt upon. Special emphasis was laid on the fact that the necessary flushing cistern prevented the domestic water-supply from having any direct connection with the closet-pan. It was also pointed out that by turning back the seat the wash-down closet was equally available for use as a urinal or a slop sink, and that as it was unusual to fit up a mahogany casing round it there was not the customary harbour for dirt.

The second lecturer was equally dogmatic and equally conclusive in his demonstration of the absolute superiority of the valve closet over every other form, especially over the wash-down. The valve closet holds a body of water that prevents the pan from being fouled in the using, and which receives and at once deodorises the faeces. When the handle is lifted the sudden release of such a large body of water effectively flushes the soil-pipe and drain. The wash-down, on the other hand, is supplied with a flush that is conveyed by a 1½ in. or 1½ in. pipe, and the contents of the pan are carried away with what is a comparative dribble, quite useless as regards flushing the soil-pipe or drain. The lecturer also drew attention to the fact that the complicated machinery complained of in the valve closet is not absent from the wash-down, but has been transferred to the flushing apparatus, many of which are most intricate and require frequent and skilled attention. He therefore disputed the claim of the advocates of the wash-down that it is simple. He pointed out that in the valve closet the hidden parts beneath the valve are all reduced in size to a minimum and are all protected and thoroughly flushed. He enlarged on the silence of the valve closet in use as compared with the noise of the flushing cistern of the wash-down; and finally he pointed

out that the valve closet could be removed for repairs without danger, because when the closet apparatus was taken away there was still a sealed trap below the floor.

This is a fair summary of the respective merits and demerits of these closets. But neither lecturer mentioned that when the valve of a valve closet is out of order the pan contains no water, and so must either remain out of use or become very foul from being improperly used.

In 1888, when I first worked in the United States, syphonic closets were fixed as the best closets in all good houses and first-class hotels. Nearly five years afterwards they were brought forward in England as something new. They hold a large body of water in the pan, like the valve closet, but that is the only point in their favour over the wash-down.

Valve closets are undoubtedly the best in positions where the noise of the flushing cistern would be objectionable, and where they will be treated with great care; also where there are other closets which can be used when one gets out of order. Care should also be taken to obtain the best quality of apparatus from a trustworthy maker. The trap should be of cast-iron and glass-lined, as recommended for

or any ignorant person ever driving a nail into the floor for any reason, is liable to drive it into the upper side of the lead branch or trap. A nail driven into the underside would not be so serious, because the leakage of water would indicate that something was wrong. But a nail driven into the upper side allows a leakage of drain-air with nothing to indicate the danger until a test is made.

For general purposes a good wash-down pedestal water-closet is far ahead of any other. In country districts, where the best skilled labour is not always readily available for repairs, it is the only closet apparatus that should be fixed. The only valid objections to the wash-down closet are the noise of the flushing and the smallness of the water area in the pan. The noise is much less in some than in others, and one making the least noise can be chosen. The position of the water-closet can also be arranged so as to isolate it from the living and sleeping rooms as much as possible. If this cannot be done altogether, a valve closet must be used. The area of water-surface also varies in different makes, and one with a large water-surface should be selected. Care must be taken that the water-surface is not too large, or the con-

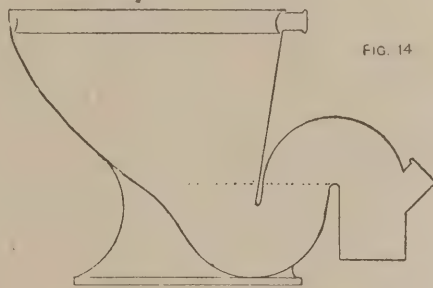


FIG. 14

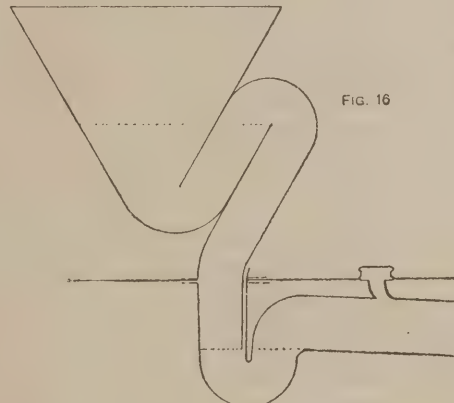


FIG. 15

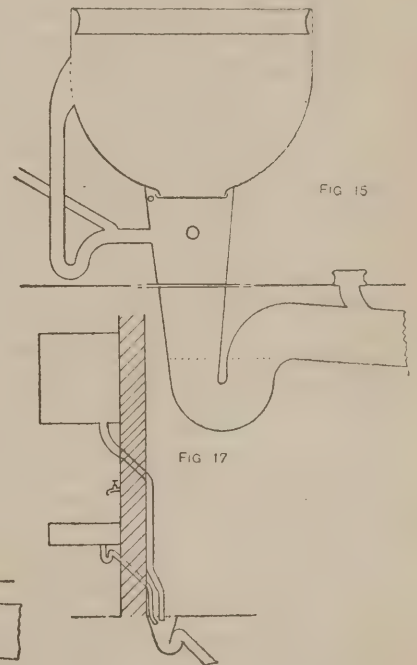


FIG. 16

the soil-pipe, and it should be provided with a flange to come flush with the floor and have bolt-holes to correspond with the holes in the closet flange. The joint between the trap and the closet apparatus should be made with red-lead putty and securely bolted. The closet-pan should be made with flushing rim and overflow arm, the overflow being trapped and connected to the valve-box. Provision should be made for recharging the overflow trap each time the closet is flushed. The overflow must be connected to the valve-box behind the closet valve when the latter is lowered, and it is thus protected against any of the contents of the pan being washed into it when the closet is discharged. The valve-box should be ventilated to the open air by two 1 in. pipes, one of which may be connected to the crown of the overflow trap, so as to act also as an anti-syphonage pipe to this trap.

Of syphonic closets there are several good makes, any of which would prove satisfactory. As a matter of fact, syphonic closets have not yet become subject to cutting prices, and therefore the temptation to scamp them has not been felt.

For the syphonic as for the valve closet the trap under the floor should be of glass-lined London County Council standard cast-iron. No lead soil-pipe should be used on good work, especially inside a building. A careless or malicious carpenter putting down floor boards,

tents of the trap may not be driven out at each flush. The seal of the trap in a pedestal closet should not be more than 1½ in. That is quite deep enough for safety, and when it is much deeper there is considerable trouble in getting all matters carried through the trap at each flush.

The closet-pan should be of white glazed stoneware, not of glazed fireclay. It is often recommended that the pedestal be quite without ornamentation, as an embossed pattern only collects the dust and coloured ornamentation hides the dirt; but in good houses, clubs, &c., they are sure to be cleaned properly, and therefore the arguments as to dirt do not so readily apply. In schools, hospitals, city offices and public institutions, however, the closet-pans should be plain. It would be well if the makers of water-closets would bear in mind the purpose for which they are used; we should then be spared some of the intricate but totally inappropriate designs now on the market.

Of flushing cisterns there seems to be an infinite variety. Only those having a syphon action, started by a pull of the chain or "pull and let-go," should be used. People do not have time in this age to hold on to a chain until the flushing tank is emptied. The waste-preventing variety is best, as any defect of the ball valve is seen by the issuing of water from the overflow pipe, instead of it trickling down the closet-pan from the flushing pipe, as in non-waste

preventors. Flushing cisterns should be made of wood and lined with tinned copper, as they are then much less likely to suffer from frost than those made of cast-iron. In all better class work in America the flushing cisterns are made of hardwood to match the closet seats.

A further advantage of a wash-down closet is that by turning back the seat it can be used as a slop sink or urinal. Urinals should never be fixed in private houses, as a wash-down closet is as effective and much less likely to become offensive. When urinals are fixed in a building, a semi-cylindrical shield of glazed earthenware should be used such as is now generally adopted in underground conveniences. Each stall should have a separate trap connected to the outgo and leading to the soil-pipe or drain. Each trap should be separately ventilated. All the ventilation-pipes can be gathered into one of sufficient size and this carried up like the soil ventilation-pipes. In a recently-published book it is recommended that urinals should discharge into surface traps in the open air. This is wrong; and in London the new drainage by-laws passed last year forbid it. Some of the most troublesome complaints I had to deal with as a sanitary inspector were caused by stale urine standing in gulleys, the foul smells from which were blown into open windows in hot weather.

In large houses, hotels, boarding schools, hospitals and institutions it is useful to have a slop sink on each floor. They are useful for emptying bedroom slops, water used for washing floors, paint-work, &c. They are best when furnished with a flushing rim and with a gun-metal hinged grating that can be laid across and on which pails, cans and pitchers can stand whilst being filled from the hot or cold water taps placed above them. A syphonic flushing cistern should be provided and the sink should be flushed each time that anything has been emptied into it; otherwise the foul liquids adhering to the inside surface of the sinks and standing in the traps are liable to cause annoyance. The waste pipes from slop sinks should be connected to the soil-pipe and be trapped and ventilated like those of water-closets.

Water-closets, slop sinks and urinals are the only fixtures that it is customary in England to connect directly to the soil-pipe or drain. The waste pipes from baths, lavatory basins and sinks (other than slop sinks) are disconnected at the foot and caused to discharge over a properly-trapped gully, or into a gully under the grating but above the water line, or over an open channel leading to a gully 18 in. distant. Rain-water pipes are treated as to disconnection in the same manner as bath wastes.

Waste pipes should be fixed as straight as possible. They should run from just over a gully at one end to above the roof for ventilation purposes at the other end. The waste pipes from fixtures should be branched in separately, i.e., the outlets from the fixtures should each be connected directly to the main waste pipe and not branched into each other. The waste pipe from each fixture should be trapped directly under the fixture, and every trap should be ventilated by an anti-syphonage pipe of the same internal diameter as the waste pipe to which the trap is connected, such anti-syphonage pipe to be carried up above the roof. It should not be connected to the waste pipe above the highest branch, and certainly should never be cut off flush with the face of the wall, as recommended in most text-books.

White glazed porcelain baths are the best. Plinished copper does not keep so clean, and enamelled iron is only clean so long as the enamelling remains unchipped; the unequal expansion and contraction of the iron and the enamel causes the latter to crack. Porcelain baths are better when provided with a flushing rim. The hot water entering through the rim warms the porcelain and so removes what is otherwise a serious objection to these baths. After use also, by turning on the water all scum left by the receding water is carried away. The waste pipe should be of 2 in. diameter, the outlet from the bath being 3½ in., protected by a grating. The old-fashioned plug and chain, against which so many objections have been raised, is still as good an arrangement as any that has been substituted for it. When an overflow pipe is necessary it should be run through the wall and cut off about 8 in. from the face of the wall and have a copper flap soldered on the end.

A shower bath, with needle spray, liver spray and douche attachments, should be fixed in the bathroom, enclosed in a marble stall and fitted with hardwood floor grating. The walls and floor of the bathroom should be tiled, the floor having a slight fall away from the door to the foot of the bath, under which should be a trapped waste pipe protected by a grating. Any water spilled on to the floor will then run off. The room also can be washed out with a mop and a hose-pipe attached to one of the taps. When the walls and floor are tiled as recommended the overflow pipe from the bath is omitted, as an overflow of water could do no harm.

Water-closet apartments and sculleries should have tiled floors and be tiled on the walls up to about 4 ft. high, the floors being drained as recommended for bathrooms. When the floors are not tiled and drained, lead safes about 3 in. deep should be fixed under baths, water-closets and lavatory basins, fitted with waste pipes cut off like overflow pipes about 8 in. from the face of the wall, and having a copper flap on the end to keep out the wind.

Of lavatory basins the tip-up variety should never be used under any circumstances, the inside of the containers and the underside of the basins being large surfaces on which the splashing of soapy water will dry and decompose. It does not yet appear to have come to the knowledge of sanitary authorities, elected and self-elected, that foul waste pipes from baths and lavatories can give off smells as offensive as were ever given off from a sewer. Whether the smells are as detrimental to health is a medical question with which medical men do not appear to have troubled themselves.

The chain and plug arrangement is not so desirable for basins as for baths. The best waste is a hollow plug standing in a recess in the basin and acting also as an overflow. By having this form of combined plug and overflow, and by keeping the trap on the waste pipe close up to the outlet of the basin, there are no parts inaccessible for cleaning. Hidden parts which are open to the atmosphere of the room, but beyond the reach of the scrubbing brush, should be rigorously excluded from all good plumbing-work. The lavatory basin, like the bath, is best when supplied by a flushing rim.

Scullery sinks should be of white glazed stoneware. Glazed fireclay is often recommended, and is used in making both sinks and pedestal closets, but it is very inferior to stoneware. When the glazing of a fireclay sink gets chipped the material of the sink absorbs water like a sponge and becomes impregnated with grease and filth. Stoneware is practically non-absorbent. A plug and overflow, as recommended for the lavatory basin, is best, on account of cleanliness.

In the butler's pantry the sink should be of tinned copper, as being less likely to cause breakages than earthenware, and as being cleaner and more durable under changes of temperature than lead. The plug and overflow should again be as for the lavatory basin.

The scullery sink waste should discharge into a deep-seal gully with large water-surface. A flushing tank with 3 in. flushing pipe should also discharge into the same, as shown (Fig. 17), to break up the grease after it has congealed and drive it down the drain.

(To be continued.)

A Statue of Queen Victoria at Portsmouth is proposed to be erected. The figure is to be in bronze, 11 ft. in height, and is to be placed on a massive pedestal of Aberdeen granite. The work has been entrusted to Mr. A. Drury, A.R.A., and the statue is to be ready for unveiling at the end of September or early in October.

A New Isolation Hospital at Rhondda has been erected. The building, which is on the most modern lines, is situated at the junction of Penrhys Road and Hospital Road, Ystrad Rhondda. The hospital is composed of seven blocks of buildings, namely, the administrative block, scarlet fever pavilions, typhoid pavilions, laundry and disinfecting block, mortuary, discharging block and stable. The whole structure is of local stone, surrounded by a wall, and within the enclosure is ample room for extension of the hospital. Accommodation is provided for thirty-two patients. The cost amounted to £13,385. The plans were prepared by Mr. W. D. Morgan, architect, Ton, who was successful amongst ten competing architects.

THE USE OF BRICK IN NEW YORK.

SPECIFICATIONS for new buildings in New York include more brick than formerly. Nearly all the new sky-scrapers have a larger proportion of brick than before, and the new apartment houses and dwellings are principally of brick. A recent trip around the city has shown that nearly all the new buildings now in process of construction are being mostly built of brick. Some are red, some are buff, some are white, but, whatever the colour, they are brick, and therefore indicate that in the near future some of the surplus, which has proved so troublesome hitherto, will be utilized. It is noticeable, too, that much pressed brick is being used for trimmings on the smaller buildings. Contractors are putting it in place instead of stone.

Builders of sky-scrapers got a lesson about a year ago, when the Home Life Building on Lower Broadway burned. Fourteen storeys high, it caught in the upper floors, and, because of the practical impossibility of forcing water to that height, it burned down slowly until the fire got sufficiently low that it could be fought successfully, when it was extinguished. The front of the building is of white marble, and every particle of it had to be taken down as low as the fire reached, which was to the seventh or eighth storey. It was cracked and warped so that the building inspectors pronounced it unsafe, ordered the erection of a protecting platform immediately, and closed that side of the street to travel until the dangerous material was removed.

The fire was not the hottest on that side. The building which burned entirely down was a low store on another side. The fire was fierce there. That side of the big office building was of brick, and it not only withstood the heat, but was found to be so good that not a brick was ordered to be removed, and the wall stands to-day just as it stood before the fire. The big steel girders on that side were bedded in the brick and did not heat enough to buckle at all. They remain to-day just as originally placed.

It does not require a very elaborate argument to show which material was the better there. And whenever the test has come brick has never failed, while stone has never stood. The truth of the matter is it cannot stand. Its very composition precludes that possibility. Hot water will cause it to explode if it is hot, and cold water will cause it to crumble like broken glass. Why, then, build of it? Why use it in buildings which may be subjected to intense heat? Simply because the merits of brick for such work are not convincingly demonstrated to builders or owners about to build.

One of the wealthiest banks in New York is about to build a bank structure for its own use. The new building is to be on Pine Street, in the very heart of the financial district, but, instead of erecting a great office building, the bank will put up a four-storey structure and occupy all the floors. And it is to be largely of brick. There may be some stone trimmings around the windows and doors, but apart from that it will be of brick throughout. The intention is to make it fireproof, and the brick construction is thought to meet the requirements more effectually than stone.

In several ways this building is a radical departure from the usual method of building in New York. In the first place it is not to be a sky-scraper. The bankers think it is better to occupy their own building alone than it is to pile up a large number of storeys above what they want for their own use, with the prospect of losing money in the end. Sky-scrapers are not always profit-bringers. Some of them are very large "white elephants," which the present owners would sell at a low figure to save themselves from feeding them any longer.

The next important difference is the open recognition of brick as a superior fireproofing material. Formerly the wealthier builders have used brick in the rear or the sides, where it comes in contact with other buildings, but it has not been put prominently in front as a means for reducing fire risk. And yet a moment's consideration should be sufficient to convince any intelligent man that brick is in every way safer than stone. The very fact that brick is fired in

a kiln where the heat is sufficient to make it white is enough to show that it would stand fire where porous stone, which had never been fired, would not.

Firemen dread a fire in a stone building. As soon as the stone gets hot and cold water is thrown upon it, as is always the case, there are dangerous fissures formed or serious explosions occur. Not in the sense that the explosions themselves cause loss of life directly, but they weaken the walls so that they will not stand. Every fireman understands perfectly the risk he runs in going on the roof of a stone building. An explosion in a wall may send the entire roof into the cellar without a moment's warning. Steel will not stand heat and water, but brick will. It cannot be melted and it cannot be buckled. If steel girders are encased in brick there is very little danger that they will be injured.

The writer has examined a great number of burned buildings within the past few years, and has come to the conclusion, after making comparisons, that stone is not much safer than wood. So far as catching from the outside is concerned, unless the fire be very strong, there is no more danger than with brick. But if it does not catch it might just as well, because, if cold water touches it when it is hot, there is trouble. When brick is hot, under the same circumstances, it will give forth a cloud of steam when wet, but there is nothing else to show that it has been touched. The walls stand intact, and generally are not dangerous to work on afterwards.

If the question of expense be worthy of consideration, brick would certainly be more attractive than stone. It requires less work to transport it, less to handle it, and less to put it in place in the building. Under modern methods of working a brick building will go up almost as rapidly as one of wood. The relative expense of building is not much more. The first cost of the material is more, but it lasts longer with less attention, which compensates for first extra cost.

Within the past four years brick has been gradually working its way into New York. There is a new apartment house near Broadway and Thirtieth Street which is built entirely of brick. It is warranted fireproof, and it comes as near to it as any structure in the city. To make doubly sure that there would be no rush of fire up the elevator shaft, the well was built outside the building, and is of brick. No fire could possibly catch from the outside, and, if it started inside, the draught would not draw the flames up through the middle of the building. It is the most modern in its appointments, and certainly the safest from fire.

Brickmakers should point to that structure as being in every way the best for the purpose in the city. They should show to intending builders that brick is, of all material, the best adapted to the purpose because it guarantees safety.—(Extracts from an article in the "Clay-worker" of Indianapolis, U.S.A.)

Surveying and Sanitary Notes.

Royal Warranty.—Messrs. Thomas Crapper & Co., of Marlborough Road, Chelsea, are again the recipients of royal favour, having been appointed sanitary engineers to His Royal Highness the Prince of Wales. They already hold a similar appointment to the King.

Proposed Widening of Leadenhall Street.—The Corporation are contemplating widening the Aldgate end of Leadenhall Street, which at present is much too narrow for the increasing traffic. The London County Council have been asked to contribute half the cost, as the Corporation contend that the improvement will be of benefit to the whole metropolis. The County Council have suggested that the Corporation should do portions of the work as opportunity offers when leases fall in or when premises are being rebuilt. The Corporation at present are not in favour of adopting that course. The improvement would cost between £600,000 and £700,000.

Engineering Notes.

The Uses of Engineering Models.—A paper on "The Uses of Engineering Models" was recently read before the Institution of Junior Engineers by Mr. Percival Marshall, A.I.M.E. After pointing out the historical value of models as a record of engineering progress, the author suggested that present-day firms would confer a valuable benefit on engineering posterity if they would make a point of presenting to the national collection at South Kensington a scale working model of all important novelties in engineering construction which they might introduce. The author dealt with the scientific and commercial uses of models, and then passed on to their important use in connection with educational work. He advocated the construction of simple well-designed model engines in technical school workshops in preference to work of a heavier character, expressing his opinion that the average student would learn more about the construction and working of an engine by making a complete model himself than by making one or two parts only of a large engine, and, moreover, would take a far greater interest in doing something which would be entirely his own work when finished.

A New Bridge over the Tyne.—The North-Eastern Railway Company have given the contract for the building of a new high-level bridge over the River Tyne at Newcastle to the Cleveland Bridge and Engineering Co., Ltd., of Darlington. The present high-level bridge, connecting Newcastle and Gateshead by road and railway, was opened in 1849, having been designed by the late Robert Stephenson. The total cost of the bridge, including land and approaches, was £491,000; and during the half century that has since elapsed the bridge has served the traffic of the railway company for a l purposes south of Newcastle. For some years past, however, considerable delays have arisen because of the restricted means of reaching the city from the south, and recently the North-Eastern Railway Company resolved in order to relieve the traffic to erect a new bridge over the river a few hundred yards west of the existing bridge. The planning of so important a work has necessarily involved a large amount of labour. In point of size and cost this will be the largest bridge contract which has been given in the United Kingdom since the completion of the Forth Bridge. The estimate of the engineer (Mr. Charles A. Harrison) of the cost was £470,000, but the contract is for rather less than that sum. The contract comprises a railway of four lines of road, beginning at a junction with the Newcastle and Carlisle Railway west of Newcastle and terminating by a junction on the main line east of the new bridge on the Gateshead side, being a length of over half a mile of viaduct. Besides, there is included a connecting loop railway of two lines of road, beginning at a junction with the railway at the south end of the bridge and joining the main line again to the west of Gateshead Station, this second railway forming a viaduct about 80 ft. in length.

The Simplon Tunnel.—The contractors for the Simplon Tunnel are at last in a position to publish returns of the progress made and to forecast the rate of advance for the future. Work has been going on steadily on the Swiss side, but on the Italian side great difficulties have had to be overcome. For some time a great rush of water impeded operations, and as soon as this difficulty was neutralised a sort of landslide composed of broken rock and earth had to be dealt with. The pressure of this landslide was so great that it repeatedly broke wooden shores 20 in. in diameter, and it became necessary to dismount three times in succession the machinery for boring. At last it was found possible to hold in the sliding mass by means of metal blocks, and before long it will be possible for the service locomotive and trucks to pass up to the boring point. The time lost in overcoming these difficulties was thought by outsiders to be disastrous to the contractors; but their calculations, based on the minimum rate of boring, allow them six months' margin, and the distance which has been lost by the delay corresponds to little more than a month of boring at the average rate. The tunnel must

be ready on the 13th of May, 1904. The programme of the contractors was to have finished the whole 19.73 kilometres at the end of 1903. The proportion which, according to this plan, ought to have been bored at the present moment is 11.6 kilometres. The distance actually bored is 11.15 kilometres. There remain about 8.6 kilometres to bore during the next two years. To do this it will be necessary to complete 11.8 metres a day, or 5.90 metres at each end of the tunnel. Since the average rate of boring has been about seven metres a day at each end, or fourteen metres a day altogether, the contractors expect, in the absence of obstacles more serious than those yet encountered, to finish their work well before the appointed time.

THE GREAT DAM AT ASSUAN.

THE correspondent of the "Times" says that, now the dam across the Nile near Assuan is approaching completion, attention naturally turns to the sluices which have rendered this great work possible—those invented by the late Mr. F. G. M. Stoney. The principle involved consists in substituting for the usual sliding action of the sluice face against its fixed frame a rolling action—that is to say, a number of rollers are placed between the fixed and moving faces, which have the effect of so greatly reducing the friction that it is possible to construct sluices of almost any size and to stand almost any head of water, and yet to be easily operated by hand-power. The half-tide sluices across the Thames at Richmond and those on the Clyde at Glasgow are perhaps the most notable examples of such sluices. In the latter case the sluices are 80 ft. wide and 12 ft. deep, and yet they can be worked by two men. When the construction of the masonry of the dam was entrusted to Messrs. John Aird & Co. a contract was also entered into by the Egyptian Government with Messrs. Ransomes & Rapier, Ltd., to supply the sluices and lock gates for the project, owing to their great experience as makers of the "Stoney" sluice.

The sluices are made at Ipswich, where they are all put together and tested before despatch to Assuan. There are in all 180 sluices, each 6 ft. 6 in. wide, giving a combined water-way of nearly 1,134 ft. One hundred and forty of the sluices are 23 ft. deep, the remainder being 11 ft. 6 in. They are built in the dam to close culverts at various levels to suit the bed of the river. Those at the lowest level (of which there are sixty-five) have to work against a 6 ft. head of water, which represents a pressure of 210 tons against a sluice. Notwithstanding this, however, it is arranged that one man can work them, so as to regulate the water passing from the reservoir. A large number of the sluices are already in position in the dam, and others are being erected as quickly as the progress of the masonry will permit Messrs. Ransomes & Rapier's resident engineer to proceed. In consequence of the rapid manner in which the two contracts have been carried out, the dam and sluices will be finished by the end of next June, and thus enable the Egyptian Government to take advantage of the end of this year's flood to fill the reservoir and have a supplementary supply ready for next summer's crops, instead of having to wait for the following year, as provided by the contract. Messrs. Ransomes & Rapier, Ltd., are also supplying and are now erecting the five lock gates. These gates are of unique design, the two upper ones being the largest single-leaf gates in the world. They will be worked by hydraulic power generated by a turbine placed in the dam, and are constructed to stand a pressure of over 1,740 tons. Each gate is suspended from a carriage which travels upon bascule girders so as to run the gate back into a recess in the side of the lock, the bascules being then raised so as to permit masts to pass them. The gates are each 32 ft. wide and are respectively 59 ft., 59 ft., 46 ft., 36 ft. and 26 ft. deep. Sir Benjamin Baker, who is acting as consulting engineer to the Egyptian Government, has just returned from a visit of inspection to Assuan and is much pleased with the progress and character of the work. It is believed that the official opening will take place early next year.

Keystones.

The Industrial Freedom League has just been formed. Its offices are at 53, Parliament Street, S.W.

Marble Busts of Ruskin and Browning have been placed in the large hall of the South London Art Gallery, Peckham Road. They were presented by Mr. Passmore Edwards.

Westminster Cathedral Bells.—The enormous tower of the Westminster Cathedral is intended for bells, but it is asserted that from the topmost storey the sound will hardly sink to human levels.

Liverpool Cathedral Controversy.—As a counter-blast to the letter referred to on p. 73 of our last issue, Mr. F. M. Radcliffe says he entertains no doubt whatever that the further money necessary to build on St. James's Mount "a cathedral not unworthy—if architectural skill be forthcoming—to rank as a representative of its age in the great series of English cathedrals" will be cheerfully and liberally contributed.

A New Technical Institute at Cleethorpes has been erected at the top of Isaac's Hill. On the ground floor are a classroom, wood-carving room, clay-modelling room and a chemical laboratory. On the first floor are an art-room, another chemical laboratory and a lecture theatre. The building, which has cost about £2,100, was designed by Mr. F. W. Croft, architect, the builder being Mr. W. Ion; both of Grimsby.

In the Roman Catholic Cathedral in Portsmouth on the left side of the high altar there is now approaching completion a beautiful chapel to the memory of the late Bishop Virtue, who died in May, 1900, and was the first Roman Catholic Bishop of Portsmouth. Above an altar of onyx and marble is a stained window containing the portrait of the late Bishop, and the walls are decorated with paintings of the English saints, executed by Mr. Westlake, of London, who is still at work upon them. The roof is richly decorated, and the entire chapel is a very rich piece of work.

The Birkenhead Institute has been extended by additions which complete the façade to Whetstone Lane, comprising an entrance-hall with cloak-room accommodation, &c., and classroom on the ground floor. The first floor is an extension of the science department, in the shape of a physical laboratory, with small workshop and dark-room attached. The façade to Whetstone Lane is of white Storeton stone, "scutch faced," with dressed quoins and moulded window jambs, &c. The architects are Messrs. T. Mellard Reade & Son, of Liverpool. The contractor for the present additions is Mr. Charles Burt, of Liverpool.

A Smethwick Competition.—The Smethwick Town Council last week considered the report of the Watch Committee on the competitive designs for the proposed new police buildings to be erected in Halford Street. Four sets of plans were received, and the Committee recommended that those of Mr. J. P. Osborne (to cost £12,656) be accepted. An amendment to accept the plans of Messrs. Wood & Kendrick (£9,000 or £10,000) was defeated, but a motion to refer the plans back to the Committee was carried by the casting vote of the Mayor, and three members of the Committee said they would resign.

Glasgow Technical College Architectural Craftsmen's Society.—On Friday last Mr. James McLeod read a paper on "Prevention of Damp in Walls," Mr. Alexander Davie, I.M., occupying the chair.—A visit took place on Saturday afternoon following to the "Stevenson Memorial Church," of which Mr. J. J. Stevenson, F.R.I.B.A., London, is the architect, and which was recently opened. This church is a handsome Gothic edifice in a Scottish treatment, situated at Belmont Bridge, overlooking the River Kelvin. The interior shows an effective use of white pine finishing. The party was courteously conducted over the building by Mr. George Calvert, clerk of works.—A sketching party of the Society intend visiting Birmingham, Worcester and Lichfield at Easter, under the guidance of Mr. James McKissack, architect.

The Statue of the Queen at Calcutta by Mr. George Frampton, A.R.A., was unveiled last Wednesday. It is hoped that it will presently adorn the Memorial Hall.

Mr. Cadwallader Bates, of Langley Castle, Northumberland, a well-known antiquary, who wrote a history of the county and a history of the Mediæval Border Towers, died recently.

The Affairs of H. W. Roberts, architect, of Newmarket, were considered at a public examination held at the Cambridge Bankruptcy Court last week. The examination was closed.

In the David Lewis Northern Hospital, Liverpool, which was recently opened by H.R.H. Princess Louise, the locks, fanlight gearings and fittings throughout were supplied by Messrs. Colledge & Bridgen, of Wolverhampton.

Institute W. Schimmelpfeng.—The annual report of this Institute contains various items of interest to those who appreciate the importance of organised mercantile reporting, especially in view of the critical state of trade abroad during the past year. A branch office is to be opened in Manchester for the reporting service on traders in that city and its suburbs. The London office is at 137, Cheapside, E.C.

The Surrey Archaeological Society held its annual meeting at Guildford recently. The report alluded to the satisfactory results which had attended the excavations at Waverley Abbey, Farnham. During the year the foundations of the pulpitum, or portions belonging to the monks' stalls, were discovered, as well as the foundations of the lay brothers' infirmary hall, measuring roughly 94ft. by 41ft., with the bases of the pillars of the north and south arcades *in situ* and for the most part in excellent condition.

Mr. F. M. Gardner, formerly in partnership with the late Mr. E. W. Fry, surveyor and architect, of Dover, has recently been appointed assistant municipal building surveyor by the Town Council of Johannesburg, he having previously held an appointment on the civil staff of the Royal Engineers at Cape Town. During the time of his partnership with Mr. Fry in Dover, the main thoroughfare was rebuilt, and Mr. Gardner had a principal hand in preparing the plans and designs for the new frontages which are the leading features of modern Dover.

Back Numbers of "Specification" Wanted.—A number of subscribers to "Specification No. 5" have expressed a wish to purchase the previous four numbers. Numbers 1, 2 and 4 have, however, been out of print for some time. We are now willing to exchange a copy of No. 5 for the two numbers 1 and 2, and similarly a copy of No. 5 in exchange for No. 4. If any readers who desire this exchange will send their copies, carriage paid, addressed to the Publisher of "Specification," Effingham House, Arundel Street, Strand, London, a current number will be forwarded by return.

The Manchester Society of Architects held its last meeting of the winter session on March 13th. The president, Mr. Alfred Darbyshire, presented the prizes to the successful students, after which Mr. Isaac Taylor gave a criticism on the work submitted. The drawings sent in for the various competitions were over fifty in number and were hung round the room. The winners for the design for a gatehouse—the February subject in the class of design—were: Senior class, Mr. J. T. W. Brooke; junior class, Mr. G. F. Ely. The winner of Mr. Holden's prize for an art gallery was Mr. P. A. Horrocks. Special second prizes for the gatehouse were also awarded to Mr. C. Peterson and Mr. Harold Hill.

Baldersby Hall, a fine mansion near Ripon, the late seat of Viscount Downe, has been partially destroyed by fire. The mansion has only recently passed into the possession of Mr. J. Brennan, of Manchester, being in the hands of workmen fitting electric light and heating apparatus. Notwithstanding that the north-west wing, the servants' department and the stables were saved, the damage amounted to several thousand pounds. The whole of the large south-west wing, including the entrance hall, dining-room and other apartments, was gutted, and it was only with the greatest difficulty that the north-west wing was saved. Most of the valuable furniture, which was in the hall, was hastily removed into the park.

The Cretan Explorations.—Mr. Arthur Evans reports in regard to his further excavation of the palace at Knossos:—Progress has been slow but satisfactory. South of the hall of the double-axes important rooms are opening out. One of these, apparently containing another "bath" and parapet, shows a high dado of fine gypsum slabs with a fresco frieze—spiral pattern—still partly in position above it. In the adjoining room also a good deal of fresco has been found, quite an aquarium of fish, and the upper part of a good female figure. A very interesting magazine has come to light—closed since the earliest palace period—containing vases of the Kamares class, some with beautiful lily designs in white; and another very remarkable find is a kind of domestic shrine at the end of a room with a small painted female image in position.

New Patents.

These patents are open to opposition until April 26th.

1901.—Travelling Cranes for Machine Shops, Factories, &c.—4,865. A. J. BOULT, 111, Hatton Garden, London, W.C. (communicated by The Chisholm & Moore Manufacturing Co., Cleveland, Ohio, U.S.A.). The driving motor and hoisting drums on the crane, which travels on the usual guideways at each side of the building, are operated by compressed air, the feed pipes being connected with a central sets of taps in the shop so that the different movements can be easily controlled.

Pipe Joints.—5,617. P. O. FELL, 43, Earham Road, Norwich. The socket end of the pipe tapers inwards and the spigot end has an inclined projecting lug, the space between the two being filled with the cementing material. By these means the two ends are prevented from being drawn apart, and there is no risk of the cement exuding into the pipe.

Lavatory Basins.—7,594. W. OATES, Horley Green Works, Halifax. In order to provide a fresh supply of water for each person using the basin, the tap has a rose end so placed that the water is sprayed over the whole of the basin. A non-closable waste pipe is provided. The fitting is specially intended for public schools and similar institutions.

Rotary Kilns for Cement, &c.—9,369. H. H. LAKE, 45, Southampton Buildings, London, W.C. (communicated by Fellner & Ziegler, Kreuznacherstrasse, Bockenheim, Frankfurt-on-the-Main). A nozzle is provided for mixing coal-dust with air and the flat flame so produced is directed upwards on to the lowest portion of the kiln. It is claimed that better results are thus obtained than by using a flame directed somewhat downwards.

The following specifications were published on Thursday last, and are open to opposition until May 5th. A summary of the more important of them will be given next week. The name in italic is that of the communicator of the invention.

1901.—4,625, WILSON, constructing piers, walls, &c., and sinking shafts. 5,269, WRIGHT, chimney cowl. 5,311, MINDELSON, guard for circular saws. 6,065, BÜTTENBENDER, wallpaper trimming-machine. 6,115, BRODIE, constructing buildings for the poor. 6,183, LEWIS, pipe joints. 6,199, CLARE, metal and concrete walls, floors, &c. 6,570, TWYFORD, water-supply fittings for baths, lavatories, &c., in asylums. 6,888, PULLAN & MANN, brick-pressing machines. 17,041, HEENAN, furnaces for burning refuse. 7,340, RACKHAM, hydraulic rams. 7,835, PETERSON & JOHANSSON, elevators for letters. 8,138, HARRISON, HARRISON & HARRISON, draw-back locks and night latches. 8,364, HUMPHREY, pipe-joints. 13,273, ELLIOTT, raising and lowering windows. 16,105, WILKINSON, stocks and dies. 16,198, JORGENSEN, hot-water heating apparatus. 22,832, BORDEN, machines for cutting screw-threads. 23,231, LAKE (Curtis), taps. 24,818, FITLER, machine for cutting and shaping wood. 25,785, RICHARDS, DOUGHERTY, WILLIAMS & WILLIAMS, squib, for blasting purposes. 25,935, ELLIOTT, stencil-cutting machines. 26,606, ZIMMER, conveyors.

New Companies.

Coronation Pottery Co., Ltd.

Registered to carry on at Stoke-on-Trent the business of manufacturers of and dealers in earthenware, china, glass, potters' materials. Capital £1,000 in £1 shares. The directors are H. Peaks, L. Forester and W. P. Moreton.

European Electric Railways and Public Works Construction Co., Ltd.

Registered to carry on business as contractors for public or private works, as mechanical and civil engineers; to construct and maintain rail and tram roads, gas and electric works. Capital £21,000 in £1 shares.

House of Issue, Ltd.

Registered to buy, take on lease, or otherwise acquire timber estates and agricultural lands, rights to cut timber; as timber and lumber merchants, sawmill proprietors, &c. Capital £10,000 in £1 shares. Registered office: 39, New Broad Street, E.C.

Crossley & Sons, Ltd.

Registered to acquire the business of wholesale builders' factor and dealer in building materials, now and hitherto carried on at Boundary Road and Station Road, Middlesbrough, at Coatham, Redcar, and at Stockton-on-Tees, Durham. Capital £3,500 in £1 shares. The directors are J. Crossley, Alfred Crossley, Arthur Crossley, and C. E. Crossley.

Guaranty Incandescent Mantle Co., Ltd.

Registered to acquire the goodwill of the business of manufacturers, importers, and dealers in gas mantles, as carried on by J. Stein and E. Schultz, as the Guaranty Incandescent Mantle Company. Capital £5,000 in £1 shares (1,500 deferred). The directors are J. Keith, J. Stein, and E. Schultz. Registered office: 20, Eastcheap, E.C.

Plaissetty Mantle Syndicate, Ltd.

Registered to acquire from A. M. Plaissetty and E. Sepulchre improvements in the manufacture of incandescent filaments and mantles for the United Kingdom and colonies of Great Britain (excepting Canada); and to deal in and with mantles, filaments, threads, silk burners used in connection with incandescent lighting. Capital £10,000 in £1.

Bullgill Coal Co., Ltd.

Registered to acquire the business of the Bullgill Coal Company as carried on by J. McKelvie; and, generally, to carry on the business of colliery owners, ironmasters, lead smelters, lime, brick and coke manufacturers, &c. Capital £10,000 in £1 shares. The directors are J. McKelvie, J. S. Smith and W. Collie. Registered office: Bullgill, Maryport, Cumberland.

Armitage Barnard & Co., Ltd.

Registered to carry on the businesses of oil boilers, oil refiners, paint, colour and varnish manufacturers, importers and manufacturers of chemical, industrial, and other preparations, articles and compounds, anti-friction greases, anti-fouling compositions. Capital £5,000 in £1 shares. The directors are G. Chadwick, W. S. Mellon, and G. L. Tucker. Registered office: 183, Great Portland Street, W.

Cape Glass Co., Ltd.

Registered to carry on in all or any of their respective branches the businesses of glass manufacturers, and as dealers in all substances used in the manufacture thereof; makers of jars, tubes, tableware, and electrical goods, rolled, sheet, and plate glass, glass benders, bevellers and drillers, staining, colouring, and tinting glass and other materials for all purposes; workers in lead for the purposes of leadlights; manufacturers of and dealers in pottery of all kinds, bricks, &c.; dealers in stone, minerals, slate, cement, &c. Capital £100,000 in £1 shares. The directors are A. J. Elwes, J. H. Brodie, J. W. Brodie and J. Forster. Registered office: 110, Cannon Street, E.C.

John Whittle & Son, Ltd.

Registered to carry on business as builders' furnishes and general ironmongers contractors and outfitters, hardware dealers, joiners, cabinet makers, upholsterers, drapers, dealers in china and glass, paper-hangers, oil and colour merchants, metal, stone and woodworkers, &c. Capital £22,500 in £1 shares. Managing director, W. Whittle.

Exeter Building Estates, Ltd.

Registered to acquire in the city of Exeter any land, buildings, estates, real or personal property, in particular the Mount Radford House Estate and the Grove in St. Leonard's Road in Exeter, and to develop and turn to account the same in such manner as the company shall see fit; as dealers in all kinds of building materials, house agents, &c. Capital £4,000 in £1 shares.

Oldham Property and Investment Co., Ltd.

Registered to acquire any lands, estates and other property, whether freehold, leasehold or copyhold; to lay out land for building purposes; as builders and contractors, dealers in stone, bricks, tiles, cements, sand, lime, &c. Capital £20,000 in £10 shares. The directors are S. Thomson and R. Redfern. Registered office: 28, Retiro Street, Oldham, Lancashire.

J. Parkinson & Sons (Blackpool), Ltd.

Registered to acquire the business of Jacob Parkinson, of Blackpool, and to carry on business as builders, decorators, joiners, contractors, stonemasons, brickmakers, merchants, dealers in stone, sand and other building requisites, sawmill proprietors, &c. Capital £12,000 in £5 shares. The first directors are J. T. Parkinson, A. L. Parkinson and W. Parkinson. Registered office: Kent Road, Blackpool.

Warwick Sawmills Co., Ltd.

Registered to acquire the business of a timber merchant and sawyer as now and hitherto carried on by J. M. Wilson at 96 to 100, Henry Street, and Canal Bridge, Ancoats, Manchester, as the Warwick Sawmills Co., and to carry on the general business of timber merchants and sawyers; also as metal workers and engineers, &c. Capital £3,000 in £1 shares (600 preference). The directors are J. M. Wilson and Elizabeth Wilson. Registered office: 96, Henry Street, Ancoats, Manchester.

Comyn Ching & Co., Ltd.

Registered to acquire the business hitherto carried on by Comyn Ching & Co. at Castle Street and elsewhere in London, and, generally, to carry on business as ironmongers, smiths, brassfounders, metal workers, electro gilders, wire workers, gas and electric engineers, tinmen, copper-smiths, plumbers, &c. Capital £30,000 in £1 shares (15,000 preference). The directors are S. Chitty, B. G. Williams, H. Ward and J. G. Smith. Registered office: 54, 56 and 58, Castle Street, W.C.

Bundock's Wharf and Cartage Co., Ltd.

Registered to acquire the business of a cartage contractor as carried on by W. H. Bundock at Palace Wharf, Wick Lane, Bow, and to carry on the general business of carters, carriers; as builders' merchants, boat builders, cart makers, ironmongers, engineers, stonemasons, builders, timber merchants, dealers in tiles, slates, bricks, building materials, &c. Capital £5,000 in sixty-five £50 preference shares, two hundred and fifty £1 ordinary shares and thirty £50 deferred shares. Registered office: Palace House, Wick Lane, Bow, E.

Harrison & Singleton, Ltd.

Registered to acquire the business of timber merchants and importers and sawmill owners as carried on under the style or firm of Harrison & Singleton at Bradford and Halifax, Yorkshire, and at West Harlepool, Durham; and to carry on business as timber importers and merchants, sawmill owners, packing case and rolling board makers, joiners, cabinet makers, builders and contractors, quarry owners, &c. Capital £100,000 in £1 shares. The governing directors are M. J. Singleton, A. E. H. Crofts, C. E. Cooper and E. M. Singleton. Registered office: 15, Singleton Street, Bradford.

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THE MANAGER, BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
March 27	Oughterard, Ireland—Repairs, &c., to Fever Hospital.	Guardians	J. Perry, Architect, Galway.
" 27	Twickenham—Alterations, &c.	Urban District Council	F. W. Pearce, Surveyor, Town Hall, Twickenham.
" 27	Pentre, Glamorgan—Firebricks, Lime, &c.	Rhondda Urban District Council	O. Thomas, Gas and Water Offices, Pentre, Glamorgan.
" 27	London, E.—Casual Wards	Stepney Guardians	F. R. Smith, 6 Great College Street, Westminster.
" 27	Halifax—Bakery, Stables, &c.	County Council	G. Buckley & Son, Architects, Tower Chambers, Halifax.
" 27	Sutton Ford, Essex—Bridge	County Council	F. J. Sheldon, Surveyor, County Offices, Chelmsford.
" 28	Gortin, co. Tyrone—Residence	County Council	J. M. Robinson, 7 East Wall, Londonderry.
" 28	Cwm-dare, Aberdare—Rebuilding Chapel	County Council	Rev. D. Griffiths, 94, Bwlfa Road, Cwm-dare.
" 28	Garridiffaith, Wales—Thirteen Cottages	County Council	A. Gay, Prospect Place, Harper's Road, Garridiffaith.
" 28	Glenkindie, Aberdeen—Alterations to Farm Offices	County Council	Jenkins & Marr, 26 Bridge Street, Aberdeen.
" 28	Hirwain, Aberdare—Villa	T. Jones	T. Roderick, Architect, Clifton Street, Aberdare.
" 28	Rotherham—Five Houses	T. Naylor	J. Platts, Architect, High Street, Rotherham.
" 28	Whitehouse, Aberdeen—Additions to House	County Council	Jenkins & Marr, 26 Bridge Street, Aberdeen.
" 29	Mickley Riding, nr. Stocksfield-on-Tyne—8 Houses	County Council	Badenoch & Bruce, 55 Pilgrim Street, Newcastle-on-Tyne.
" 29	Trowbridge—Chapel Restoration	County Council	W. W. Snaillum, Architect, Church Street, Trowbridge.
" 29	Trowbridge—Temporary Hospital	County Council	W. J. Mann, Clerk, Union Offices, Trowbridge.
" 29	Aberystwyth—Two Houses	County Council	G. T. Bassett, Architect, Aberystwyth.
" 29	Keighley—Beer Bottling Establishment and Residence	County Council	Barber, Hopkinson & Co., Architects, Craven Bank Chhs., Keighley.
" 29	Farlington, Berks—Three Houses	County Council	Belcher, Adkin & Belcher, Architects, Wantage.
" 29	Wemyss, Scotland—Cemetery Lodge, Mortuary, &c.	County Council	W. D. Sang, C.E., Kirkcaldy.
" 29	Sherfield English, near Romsey, Hants—Church	County Council	F. Bath, Architect, Crown Chambers, Salisbury.
" 29	Great Harwood, Lancs—Slaughter-houses	County Council	A. H. Dunkin, Surveyor, Town Hall, Great Harwood.
" 29	Truro—School Classrooms	County Council	Carder & Carder, 4 Princes Street, Truro.
" 29	Belfast—Sanitary Extensions to Hospital	County Council	J. F. Peddie, Scottish Provident Buildings, Belfast.
" 29	Husthwaite, near Easingwold—Dwelling House	County Council	J. Stokes, Architect, Thirsk.
" 30	Marston Magna—Restoration of Parish Church	County Council	C. E. Pouting, Architect, Marlborough.
" 31	Oswestry—Swimming Bath, Boiler House, &c.	County Council	G. W. Lacy, Borough Surveyor, Guildhall, Oswestry.
" 31	Madron—Chapel	County Council	H. Madder, 26 Clarence Street, Penzance.
" 31	Blyth, Northumberland—Stones for Concrete	County Council	Sandeman & Moncrieff, 1 St. Nicholas Bldgs., Newcastle-on-Tyne.
" 31	Abercynon, Wales—Twenty-eight Houses	County Council	Mr. Dowdeswell, Architect, John Street, Treharris.
" 31	Blaina, Mon—Hotel	County Council	T. Roderick, 50 Glebe Road, Merthyr.
" 31	Clayton, Yorks—Warehouse	County Council	Milnes & France, 99 Swan Arcade, Bradford.
" 31	Hengoed, Wales—Six Houses	County Council	P. V. Jones, Architect, Hengoed.
" 31	Merthyr Tydfil—Villa	County Council	T. Roderick, 50 Glebe Road, Merthyr.
" 31	Patlington, near Hull—Infirmary	County Council	Runtun & Barry, Architects, Savile Chambers, Hull.
" 31	Aberystwyth—Two Houses	County Council	J. A. Jones, 7 Queen's Terrace, Aberystwyth.
April 1	Isleworth—Additions to Schools	County Council	W. Stephens, Clerk, Union Offices, Isleworth.
" 1	West Ham—Public Library	County Council	Town Clerk, Town Hall, West Ham, E.
" 1	Colne, Lancs—Grand Stand	County Council	R. S. Pilling, Architect, Colne.
" 1	East Molesley—Fire Station	County Council	J. Stevenson, Surveyor, Council Offices, Walton Road, East Molesley.
" 1	Nayland—Classroom, &c.	County Council	D. E. Thomas, Architect, Victoria Place, Haverfordwest.
" 1	Swansea—Convalescent Home	County Council	G. Moxham, Architect, Castle Street, Swansea.
" 1	Ashton-under-Lyne—Car Roof Shed	County Council	J. T. Earnshaw, Borough Surveyor, Town Hall, Ashton-under-Lyne.
" 1	Dorchester—Operating Theatre at Hospital	County Council	W. J. Fletcher, Architect, Dorchester.
" 2	Dorchester—Addition to Workhouse	County Council	W. W. Reed, 24 High West Street, Dorchester.
" 2	Leigh, Lancs—School and Chapel	County Council	Banks, Fairclough & Stephen, Architects, Leigh.
" 2	Stockton-on-Tees—Alterations, &c., to Workhouse, &c.	County Council	J. Rodham, 16 Finkle Street, Stockton-on-Tees.
" 2	Exwell—Engineer's Cottage	County Council	H. D. S. Wood, 157 Wood Exchange, Coleman Street, London.
" 2	Ashton—Manse	County Council	O. Blythe, Architect, Market Place, Morpeth.
" 2	Bangor, Wales—Pavilion	County Council	F. Bellis, 204 High Street, Bangor.
" 2	Newcastle-upon-Tyne—School	County Council	A. Goddard, Clerk, Grainger Street West, Newcastle-upon-Tyne.
" 2	Seacombe, Cheshire—Police Station	County Council	H. Beswick, County Architect, Newgate Street, Chester.
" 2	Lurgan—Seventeen Labourers' Cottages	County Council	R. H. Dorman, County Surveyor, Armagh.
" 3	Kington—Wesleyan Minister's House	County Council	A. Fairfax, Solicitor, Banbury.
" 3	Kingston-upon-Thames—Additions, Technical Schools	County Council	Borough Surveyor, Oldtown House, Kingston.
" 4	Durford, Kent—Concert Hall, &c.	County Council	H. E. Bennett, Secy., Westgate House Club and Institute, Dartford.
" 4	Leadgate, Durham—Reconstructing Cottages	County Council	C. E. Oliver, Company's Architect, Consett.
" 4	Sandbach—Villa	County Council	A. Price, Architect, Sandbach.
" 4	York—Offices	County Council	W. Bell, Company's Architect, York.
" 5	Helston, Cornwall—Police Station &c.	County Council	O. Caldwell, Architect, Victoria Square, Penzance.
" 5	Preston—Business Premises	County Council	R. Walker, 154 Friargate, Preston.
" 7	Cockermouth—Greenhouse	County Council	J. D. Kirkbride, Curator, Cemetery, Cockermouth.
" 7	Nantwich—Electric Works & Refuse Destructor Bldgs.	County Council	W. F. Newey, Market Street, Nantwich.
" 7	Macroom—Town Hall	County Council	T. Murphy, Clerk, Council Offices, Macroom.
" 8	Denton, near Gravesend—Hospital Block	County Council	City Surveyor, Guildhall, E.C.
" 9	Walsall—Bricks, Cement, &c.	County Council	F. W. Mager, District Surveyor, Aldridge, Walsall.
" 10	Middleton-on-the-Wolds—Chapel and Schools	County Council	Gelder & Kitchen, 76 Lowgate, Hull.
" 10	London, N.—Gate Porter's Lodge, &c.	County Council	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
" 10	Hither Green, S.E.—Engineer's Cottage	County Council	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
" 11	Belfast—Pair of Semi-detached Villas	County Council	Blackwood & Jury, 41 Donegal Place, Belfast.
" 12	Belfast—Two Villas	County Council	Græme-Watt & Tulloch, 77A Victoria Street, Belfast.
" 14	Kilcoe, Ireland—Church	County Council	M. A. Hennessy, 74 South Mall, Cork.
" 14	Rhoslanerchrugog, Wales—Schools and Classrooms	County Council	No. 54 Hall Street, Rhoslanerchrugog.
ENGINEERING:			
March 27	Cleethorpes—Concrete Wall to Lake	Urban District Council	E. Rushton, Engineer, Poplar Road, Cleethorpes.
" 27	Hford—Electrical Overhead Equipment, &c.	Urban District Council	W. O. C. Hawtayne, 9 Queen Street Place, London, E.C.
" 27	Castleford—Waterworks	Urban District Council	Richardson & Hartley, Engineers, East Parade Chambers, Leeds.
" 27	Ikeston—Pumping Station	Water Board	G. & F. W. Hodson, Engineers, Loughborough.
" 27	Sutton Ford, near Rochford—Bridge	Essex County Council	P. J. Sheldon, Surveyor, County Offices, Duke Street, Chelmsford.
" 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
" 29	Gorton, Lancs—Sludge Presses	Urban District Council	C. J. Lomax, 37 Cross Street, Manchester.
" 29	Haverfordwest—Road Roller, Scarifier & Stonebreaker	Town Council	R. T. P. Williams, Town Clerk, Haverfordwest.
" 31	Barnstaple—Retorts, &c.	Gas Committee	F. L. Schofield, 15 Cross Street, Barnstaple.
" 31	Braithwaite, near Keswick—Laying Water-main	Rural District Council	J. B. Wilson, Engineer, Court Buildings, Cockermouth.
" 31	Bridport—Mechanical Washer, Scrubber, &c.	Gas Committee	J. H. Cornish, Secretary, Bridport, Dorset.
" 31	Cockermouth—Laying Water-main	Rural District Council	J. B. Wilson, Engineer, Court Buildings, Cockermouth.
" 31	Kilmarnock—Loop Line	Glasgow & South-Western Railway Co.	Engineer, St. Enoch Station, Glasgow.
" 31	Fairfield, Derbyshire—Drainage	Urban District Council	Sterling & Swann, Engns., Town Hall, Chapel-en-le-Frith, Stockport.
" 31	Romiley, Cheshire—Sewage-Disposal Works	Ludworth and Melfor Sewerage Board	E. Garside, Town Hall Chambers, Ashton-under-Lyne.
" 31	Glasgow—Railway	Glasgow and South-Western Railway Co.	Engineer's Office, St. Enoch Station, Glasgow.
" 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H.W. Johnson, Mayor, Municipal Office, Rockhampton, Queensland.
" 31	Manchester—Pipelining	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
April 1	Bangkok—Rolling Stock for Railways	Siamese Government	Commercial Department, Foreign Office, S.W.
" 1	Rothwell, Northants—Two Gas Engines	Urban District Council	W. T. Pearson, Engineer, Rothwell, Northants.
" 1	Wincanton, Bath—Waterworks	Rural District Council	A. P. J. Cotterill, 28 Baldwin Street, Bristol.
" 1	London, W.—Hose Escape and Hose Tender	Acton District Council	D. J. Ebbetts, 242 High Street, Acton.
" 2	Southend-on-Sea—Electric Wiring, &c.	Corporation	W. H. Snow, Town Clerk, Southend-on-Sea.
" 2	Hove, Sussex—Sea-wall Improvement, &c.	Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 2	Perth—Extension of Filter	Corporation	A. Davidson, Manager, Waterworks, Perth.
" 2	Bradford—Waterworks	Waterworks Committee	J. Watson, Waterworks Engineer, Town Hall, Bradford.
" 2	Litherland, Lancs—Footbridge	Urban District Council	A. H. Carter, Surveyor to Council, Sefton Road, Litherland.
" 2	Milton, Derbyshire—Borehole	Swadlincote & Ashby-de-la-Zouch U.D.C.	S. R. Lowcock, Engineer, Temple Courts, Birmingham.
" 2	London, E.C.—Heating Apparatus, &c.	Holborn Union Guardians	J. A. Battersby, Clerk, Offices, Clerkenwell Road, E.C.
" 2	West Ham—Ward and other Stoves, and Ranges	Union Guardians	F. E. Hilleary, Clerk, Union Workhouse, Leytonstone, N.E.
" 3	Cannock, Staffs—Hot-Water Supply	Workhouse Guardians	A. W. Carver, Clerk, Union Offices, Cannock.
" 8	Bridlington—Road Bridge	North-Eastern Railway Co.	W. J. Cudworth, Company's Engineer, York.
" 9	Warrington—Electric Tramways	Corporation	Prece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 9	London, N.E.—Water Tube Boilers, &c.	North-Eastern Railway Co.	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 9	Bessingby—Road Bridge	Director-General	W. J. Cudworth, Company's Engineer, York.
" 10	Alexandria, Egypt—Hydraulic Press	Director-General	Director-General of Customs, Alexandria.
" 12	Edinburgh—Arc Lamp Columns, Cast and Iron Pipes	Stavanger Waterworks	Resident Engineer, 5 Dewar Place, Edinburgh.
" 15	Christiania—Pumps	Corporation	Stadsingeniørkonteret, Stavanger.
" 16	Devonport—Tramways	Corporation	C. Chadwell, 20 Victoria Street, Westminster.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF LIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL:			
rch 27	Manchester—High and Low Pressure Pipes	Electricity Committee	F. E. Hughes, Secretary, Elec. Department, Town Hall, Manchester.
27	Pentre, Glamorgan—Wrought-iron Tubes, Gas and Water Fittings, &c.	Rhondda Urban District Council	O. Thomas, Gas and Water Offices, Pentre, Glam.
29	Chelmsford—Water Pipes	Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
31	New Mills—Cast-iron Penstocks, Manhole Covers, &c.	Ludworth and Mellor Sewerage Board	E. Garside, Engineer, Town Hall Chambers, Ashton-under-Lyne.
31	Manchester—Bolts, Nuts, &c.	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
ril 1	Christiania—Pipes, &c.	Stavanger Municipal Engineering Board	Stadsingeniør Kontoret, Stavanger.
1	Waterloo, Lancs—Lamp Columns, Manhole Covers, &c.	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
1	Manchester—Castings, Gas and Water Fittings, &c.	Lancs and Yorks Railway Co.	Stores Department, Osborne Street, Manchester.
2	Margate—Ironwork, Ironmongery, Tools, &c.	Urban District Council	Borough Engineer, Town Hall, Margate.
2	Llandudno—Cast-iron Pipes, &c.	Government	E. P. Stephenson, Engineer, Town Hall, Llandudno.
14	Victoria, Australia—Steel Rails and Fishplates	Corporation	Agent-General for Victoria, 15 Victoria Street, S.W.
23	Calcutta—Stopcocks	Corporation	F. Gainsford, Secretary, Corporation Offices, Calcutta.
PAINTING AND PLUMBING:			
rch 27	Pentre, Glamorgan—Oils, Paint, Lead Pipe	Rhondda Urban District Council	O. Thomas, Gas and Water Offices, Pentre, Glam.
27	Leicester—Cleaning and Painting Exterior Town Hall	Corporation	E. G. Mawbey, Borough Surveyor, Town Hall, Leicester.
28	Bootle, Cumberland—Whitewashing, Painting, &c.	Guardians	J. Clark, Clerk, Broughton-in-Furness.
1	Manchester—Colours, Lead, Oil, &c.	Lancs and Yorks Railway Co.	Stores Department, Osborne Street, Manchester.
1	Hounslow—Oils and Paints, &c.	Heston and Isleworth U.D.C.	P. G. Parkman, Surveyor, Town Hall, Hounslow.
2	Margate—Paints, Oils, Colours, &c.	Corporation	Borough Engineer, Town Hall, Margate.
2	Cardiff—Painting Market	Bolehall and Glasgote S.B.	W. Harpur, Borough Engineer, Town Hall, Cardiff.
2	Glasgow and Kettlebrook—Painting Schools	Corporation	J. Lunn, Clerk, Board's Office, Tamworth.
ROADS AND CARTAGE:			
rch 27	Ashton-under-Lyne—Materials	Corporation	Borough Surveyor, Town Hall, Ashton-under-Lyne.
27	Caistor, Lincs—Granite and Slag	Rural District Council	A. A. Padley, Clerk, Council Offices, Caistor.
27	Lancaster—Materials	Rural District Council	W. Cumming, Surveyor, Lancaster.
27	Llangollen—Improvement Works	Urban District Council	Surveyor, Council Offices, Llangollen.
27	Ormskirk—Materials	West Lancashire Rural District Council	O. Law-Green, Chief Surveyor, Union Offices, Wigan R.I., Ormskirk.
27	Ramsey, Huntingdonshire—Granite	Urban District Council	F. R. Serjeant, Clerk, Ramsey.
27	Canterbury—Materials	Roads and Survey Committee	A. O. Turley, City Surveyor, Guildhall Street, Canterbury.
27	Cherryhinton, near Cambridge—Forming, &c.	Chesterton Rural District Council	Waters & Worrall, 2 Sidney Street, Cambridge.
27	Elland, Yorks—Road Repairs	Urban District Council	G. Hepworth, Architect, Bradford Road, Brighouse.
27	Gateshead—Cement Path Work	Corporation	W. Swinburne, Town Clerk, Gateshead.
27	Gateshead—Paving, &c.	Urban District Council	Borough Engineer, Town Hall, Gateshead.
27	Newbiggin-by-Sea—Road Works	Rural District Council	D. Rosser, Surveyor, Market Place, Morpeth.
27	Rochford, Essex—Materials	Rural District Council	F. Gregson, Clerk, Southend-on-Sea.
27	Uxbridge—Materials	Rural District Council	E. Birks, District Surveyor, Town Hall, Uxbridge.
27	East Molesey—Cartage and Materials	Urban District Council	Surveyor, District Council Office, East Molesey.
27	Pentre, Glamorgan—Materials and Stores	Rhondda Urban District Council	O. Thomas, Gas and Water Offices, Pentre, Glam.
28	Greystone, Carmyllie, Scotland—Repairing Road	Parish Council	Rev. S. R. Crabb, Greystone.
28	Pontefract—Materials	Rural District Council	W. A. Glover, Clerk, Pontefract.
28	St. Anne on-Sea—Streets	Urban District Council	Surveyor, South Drive, St. Anne-on-Sea.
29	Great Harwood, Lancs—Materials and Team Labour	Urban District Council	A. H. Dunkin, Surveyor, Town Hall, Great Harwood.
31	New Malden—Materials	Urban District Council	T. V. H. Davison, Dist. Council Offices, Cambridge Rd., New Malden.
31	Leeds—Carriage Drives	J. Pickersgill	T. Winn & Sons, 92 Albion Street, Leeds.
31	Morecambe—Paving Bricks, &c.	Urban District Council	J. Bond, Surveyor, Morecambe.
31	Heywood—Materials	Corporation	J. A. Settle, Borough Engineer, Heywood.
1	Dartford—Street Works	Urban District Council	W. Haston, 8 Hythe Street, Dartford.
1	Waterloo, Lancs—Materials and Stores	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
1	Hastings—Woodpaving Blocks	Corporation	P. H. Palmer, Town Hall, Hastings.
1	Isleworth—Roadways	Brentford Union Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
1	Rochdale—Paving, &c.	Paving, &c., Committee	S. S. Platt, Borough Surveyor, Town Hall, Rochdale.
1	Hounslow—Cartage and Materials	Heston and Isleworth U.D.C.	F. P. Parkman, Surveyor, Town Hall, Hounslow.
1	Wimbledon—Making-up	Urban District Council	O. H. Cooper, Engineer, Council Offices, The Broadway, Wimbledon.
2	Margate—Horse Hire and Materials	Rural District Council	Borough Engineer, Town Hall, Margate.
3	Pontypridd—Limestone, &c.	Town Council	R. Derrett, District Surveyor, Usk.
3	Luton—Materials	Blything Rural District Council	Borough Surveyor, Town Hall, Luton.
4	Bulcamp, Suffolk—Granite	Rural District Council	H. A. Mullens, Clerk, Union Offices, Bulcamp.
5	Maldon—Road Repair, &c.	Urban District Council	H. G. Keywood & E. J. Ennals, Public Hall Chambers, Maldon.
7	Dronfield, Yorks—Making-up	Town Council	T. H. Atkinson, Surveyor, Dronfield.
7	Louth, Lincs—Materials	Roads and Survey Committee	G. H. Allison, Borough Surveyor, Town Hall, Louth.
SANITARY:			
rch 27	Canterbury—Stoneware Sewer Pipes, &c.	Urban District Council	A. O. Turley, City Surveyor, Guildhall Street, Canterbury.
27	East Molesey—Stoneware Pipes, Aluminoferrie, &c.	Urban District Council	Surveyor, District Council Office, East Molesey.
28	Draycott, Derbyshire—Scavenging	Shardlow Rural District Council	J. W. Newbold, Clerk, Becket Street, Derby.
31	Alderley Edge, near Manchester—Sewer, &c.	Urban District Council	W. Cobbett, 61 Brown Street, Manchester.
31	Heywood—Earthenware Pipes, Traps, &c.	Corporation	J. A. Settle, Borough Engineer, Municipal Buildings, Heywood.
31	New Mills—Sewers, &c.	Ludworth and Mellor Sewerage Board	E. Garside, Engineer, Town Hall Chambers, Ashton-under-Lyne.
1	Exmouth, Devon—Sewerage & Sewage-Disposal Works	St. Thomas Rural District Council	Cameron, Commis & Martin, 7 & 8 Bedford Circus, Exeter.
1	Waterloo, Lancs—Stoneware Pipes, Disinfectants, &c.	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
1	Longton, Staffs—Sewers, &c.	Town Council	J. W. Wardle, Borough Surveyor, Court House, Longton.
1	Hounslow—Stoneware Pipes, Disinfectants	Heston and Isleworth U.D.C.	P. G. Parkman, Surveyor, Town Hall, Hounslow.
5	Houghton-le-Spring, Durham—Drainage Works	Urban District Council	V. Smith, 14 Newbottle Street, Houghton-le-Spring.
7	London, W.—Sewer	Kensington Borough Council	Borough Engineer, Town Hall, Kensington High Street, W.
9	Walsall—Disinfectants, Stoneware Goods, &c.	Rural District Council	F. W. Mager, District Surveyor, Aldridge, Walsall.
9	Foleshill, near Coventry—Drainage Works	Rural District Council	C. N. Lailey, 6 The Sanctuary, Westminster.
TIMBER:			
1	Manchester—Crossing Timber	Lancs and Yorks Railway Co.	Stores Department, Osborne Street, Manchester.
1	Hastings—Woodpaving Blocks	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
2	Margate—Timber	Corporation	Borough Engineer, Town Hall, Margate.

COMPETITIONS OPEN.

DATE OF LIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
h 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Edge, Sheffield.
28	Waterford Public Free Library	—	J. J. Feeley, Town Clerk, Waterford.
29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
31	Wakefield—Improvement of Interior of Exchange Buildings	£25, £10.	J. J. Martin, Bull Hotel, Wakefield.
4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
8	Oldham—Market Hall and Shops	£50, £30, £20.	S. A. Pickering, Borough Surveyor, Oldham.
21	Coleraine—Twenty-five Workmen's Dwellings	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
30	Glasgow—Branch Library (Local Architects)	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.
1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
1	York—Queen Victoria Memorial	£50.	W. H. Andrew, Town Clerk, Guildhall, York.
1	Mexborough, near Rotherham—Accident Hospital	£35, £10.	C. Brampton, Fern Villa, Mexborough.
14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted)	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
30	Sunderland—Police and Fire Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
1-14	St. Petersburg—Bridges over Great Neva River	£30, £25, £12 10s.	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
date.	Ilkeston—Public Free Library	—	H. J. Kilford, Borough Surveyor, Town Hall, Ilkeston.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BROTHERTON (YORKS).—For the execution of works and materials to be supplied in and about the laying and jointing of 3,500 lineal yards of thereabouts of earthenware pipe sewers and cast-iron pipes, the construction of manholes, lampholes, flushing tanks, and all other appurtenances, the construction of boundary fence to works, tank, filtration areas, pumping house, storage tank, &c., with all necessary valves, manholes, &c. in connection therewith, for the sewerage and sewage disposal of Brotherton, for the Pontefract Rural District Council. Mr. John Waugh, C.E., engineer, Sunbridge Chambers, Bradford:—

H. Tyson, Halifax	£2,750 0
J. H. Bentley, Bradford	5,071 0
M. Dixon, Ackworth	5,345 0
Jones Bros., Barnsley	5,310 0
H. Dawson, Bradford	4,901 0
W. Binn, Bradford	4,780 0
Egan & Sons, Bradford	4,717 0
Ward & Tetley	4,498 0
E. W. Ives, Gomersal	4,487 0
W. Sutcliffe, Sowerby Bridge	4,260 0

Accepted.

HARROW.—For (Contract No. 1) providing and laying about 35,500 lineal feet of Norwegian granite kerb, 31,500 lineal feet of Norwegian granite channel, 130 square yards of 4-inch granite cubes, for the Harrow-on-the-Hill Urban District Council. Mr. J. Percy Bennetts, engineer and surveyor:—

R. Ballard	£10,707	W. Jackson	£3,288
Meston & Hale	9,430	B. Nowell & Co.	8,257
W. Back & Co.	9,340	Neave & Son	8,116
Winipley & Co.	9,232	Lawrence & Thacker	7,870
Dupont & Co.	8,011	T. Adams	7,072
Hollingsworth	8,354	M. Dinnis	7,523
C. Ford	8,850	T. Free & Sons, Maidenhead	7,532
Griffiths & Co.	8,700		
Wheeler	8,458	W. Manders	7,390
Buxton & Jenner	8,890	Granite Corporation Co.	7,283

Accepted.

† Informal.

HARROW.—For (Contract No. 2) providing and laying about 15,000 square yards of permanent concrete slab paving, in slabs of not less than 2 inches in thickness, for the Harrow-on-the-Hill Urban District Council. Mr. J. Percy Bennetts, engineer and surveyor:—

Hard York "Non-Slip" Stone Co.	£5,007
Meston & Hale	4,701
Therkeld Granite Co.	4,322
Imperial Stone Co.	4,313
Adamant Stone Co.	4,208
W. Jackson	4,108
Patent Indurated Stone Co.	4,003
W. Manders (patent indurated)	4,003
C. Ford (Croft stone)	3,918
Nowell & Co. (Celroft stone)	3,924
Free & Sons (Croft stone)	3,803
W. Hollingsworth	3,829
Lawrence & Thacker	3,773
Victoria Stone Co. (indurated)	3,747
Neave & Sons (Victoria indurated)	3,730
Hard York "Non-Slip" Stone Co. (concrete slabs)	3,714
Buxton & Jenner (J. Ellis's stone)	3,639
T. Adams (Croft stone)	3,619
Winipley & Co.	3,584
Empire Indurated Stone Co.	3,568
Croft Granite Co.	3,565
W. Tearle (Alexandra stone)	3,543
Gibbs Bros.	3,543
Abell & Cannell	3,535

Accepted.

LICESTER.—Accepted for the erection of 13 houses and shops for Mr. E. Bentley, Lambert Road, Leicester. Mr. W. H. Simpson, C.E., architect and surveyor:—

Thomas Warden	£2,358 10
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[No competition.]

LINSLADE (LEIGHTON BUZZARD).—For the carting, excavating for, and laying and jointing of about five miles of 5-in., 4-in., and 3-in. cast-iron water-mains, including fixing valves, hydrants, &c., the erection of brick service reservoirs and filter beds, sinking well, and the erection of pumping station, and all works in relation thereto, for the Linslade Urban District Council. Messrs. Sands & Walker, engineers, Angel Row, Nottingham:—

J. F. Price, Nottingham	£7,800 0 0
A. Atkins, Leighton Buzzard	6,582 0 0
W. Manders, Leyton, Essex	5,524 0 0
Wyatt Bros., Whitechurch, Salop	5,023 0 0
W. Coker, Halling, Rochester	4,981 13 0
B. Cooke & Co., Westminster	4,807 0 0
C. Chamberlain, Leicester	4,728 14 11
C. Ford, Harlesden, N.W.	4,580 0 0
Green & Co., Aylesbury	4,540 0 0
J. H. Vickers, Nottingham	4,189 0 0
Howe Bros., Halifax	4,125 0 0
Windsor & Co., London	4,100 0 0
H. Sharrow, Nottingham	3,913 0 0
J. T. Wingrove, Northampton	3,813 0 0
T. Yirell, Leighton Buzzard	3,598 0 0
J. Dean, Chiswick	3,578 0 0

Accepted.

LONDON, S.W.—For the erection of new banking premises at the corner of Pall Mall and Waterloo Place, S.W. (site of the Old Vanders' Club), for Sir Henry Seymour King, M.P. Mr. A. E. Thompson, architect, Leadenhall Buildings, E.C.:—

Foster & Dicksee	£27,777	Maple & Co.	£22,924
Holloway Bros.	27,200	J. Carnichael	22,280
Simpson & Son	24,657	Patman & Potheringham	21,963
W. Downs	23,243		Accepted.

LONDON, S.W.—For the erection of new public offices at Westminster, for the Commissioners of H.M. Works and Public Buildings:—

W. Pattinson & Sons	£611,280	£1,000
J. Simpson & Son	618,300	398
B. E. Nightingale	595,066	398
Foster & Dicksee	592,161	—
H. L. Holloway	589,000	380
Higgs & Hill, Ltd.	585,000	—
Leslie & Co., Limited	586,670	350
J. Mowlem & Co.	580,500	383
A. King	540,500	100
Perry & Co.	545,973	—
Kirk & Randall	538,006	—
F. S. Minter	520,800	—
H. Lovatt	517,527	473
Holloway Bros.	508,115	45
R. H. Hughes	499,700	—
J. Shillitoe & Son	490,650	350
Maple & Co., Ltd.	482,992	1,000
Spencer, Santo, & Co., Ltd.	473,000	121

Accepted.

A.—Extra for Hopton Wood stone.

NEWARK-ON-TRENT.—For the erection of new clothing factory, for Messrs. Wm. Mumby & Co. Messrs. G. Shepherd and H. Harrison, M.S.A., architects:—

J. W. Smith	£7,450	A. S. Morgan & Cardiff	£4,100
G. Brown & Son	4,080		4,080
C. Baines & Son	3,900		3,900

Accepted.

NEWPORT (MON.).—For the erection of new stabling for 34 horses, Newport, for Messrs. Phillips & Sons. Messrs. Habershon, Fawcner, & Groves, architects, Newport and Cardiff:—

J. W. Jones & Son	£1,817	A. C. Parfitt	£5,662
Lawson & Co.	6,183	Leadbeater Bros.	5,507
J. Linton	5,961	C. H. Reed	5,309
Smith Bros.	5,870	F. W. Powles	5,335
D. Parfitt	5,819	D. W. Richards & Co.	5,298
E. G. Jordan	5,787	Jerrett & Fisher	5,245
C. Locke	5,750	J. Hooper	5,185
D. J. Davies	5,732		Accepted.

[All of Newport.]

NORWICH.—For extension of Northwich Post Office, for H.M. Office of Works, &c.:—

T. H. Blyth	£12,250	£100
J. Downing & Son	11,145	295
J. Youngs & Son	11,397	217
J. S. Smith	10,654	100
S. Chapman & Son	10,233	244
G. E. Hawes	9,832	140

Accepted.

A. Old materials.

RUSHDEN.—For the erection of North End Schools, Rushden, for the Rushden School Board. Messrs. Edward Sharnam, Caleb Archer, and J. Melfort Sharnam, architects, Wellingtonborough:—

Whittington & Tomlin	£2,459	Goodman & Murkett	£2,238
F. Henson	2,308	Hackley Bros.	2,293
H. Sparrow	2,380	R. Marriott, Rushden	2,200
E. Brown & Son	2,370	Berrill & Green	2,240
C. E. Bayes	2,360	T. Swindall	2,139

Accepted.

Accepted subject to approval of Education Department.

SALISBURY.—For the erection of a new residence—from plinth level—at Milford Manor, Salisbury, for Richard Gerrish, Esq. Mr. Fred Bath, F.R.I.B.A., F.S.I., architect, Salisbury:—

Guppy & Chant, Sherborne, Dorset	£12,000 0 0
Holliday & Greenwood, Ltd., London	8,557 0 0
James Dowdham, Widnes	8,386 2 7
G. H. Gibson, High Wycombe	7,965 0 0
J. Harris & Son, Woking	7,949 0 0
Executors of the late W. Franklin, Southampton	7,916 13 0
F. Merrick & Son, Glastonbury	7,908 0 0
C. H. Green, Blandford	7,800 0 0
Henry Cawte, Southampton	7,834 2 0
J. E. Nightingale, London	7,800 0 0
John Shillitoe & Son, Bury St. Edmund's	7,800 0 0
Bailey & Marlow, Downton, Wilts	7,765 10 0
Webb & Co., Salisbury	7,595 0 0
Thos. Dawkins, Bradford St. Martin, Salisbury	7,550 0 0
Wm. Beazley, Calne, Wilts	7,489 0 0
	7,176 0 0

Accepted.

Accepted subject to deductions amounting to 4700.

SEACROFT (LEEDS).—For the erection of an infectious diseases hospital for the city of Leeds. Mr. Edwin T. Hall, architect, 54 Bedford Square, London:—

W. Airey	£239,433
Roper & Sons	237,233
Shillitoe & Sons	237,000
Chambers & Sons	234,001
Armitage & Hodgson	221,362
Nicholson & Son	211,992
Arnold & Son	193,500

Accepted.

SLOUGH (BUCKS).—For supply of materials and labour required for carrying out certain works of sewerage, comprising soil air surface-water sewers, manholes, stone ejectors, carriers, &c., including about 3,350 yards of 15-in. pipes, 1,973 yards of 12-in. pipe, 11,000 yards of 6-in. pipes, and 1,350 yards of 6-in. pipes, for the Slough Urban District Council. Mr. W. W. Cooper, engineer:—

W. H. Wheeler, London	£31,806
Winipley & Son, London	28,174
Trim, Eastleigh	26,343
Free & Son, Maidenhead	24,750
Oseinton, Westerham	24,341
Lee & Son, High Wycombe	23,913
Cooke & Co., Westminster	23,870
C. Ford, Harlesden	23,820
Binns, Croydon	23,566
Lang, Liskeard	23,323
Deveritt, Slough	22,507
Jones & Son, Neath	21,110
Jackman, Slough	20,073
J. Jackson, Plaistow	20,800
Wilkinson, Bros., London	19,129
Johnson & Langley, Leicester	18,185

[Engineer's estimate, £39,270.]

TAUNTON.—For the erection of buildings in connection with the proposed destructor in the Target Field, for the Town Council. Mr. T. H. Smith, borough surveyor:—

Mogridge, Taunton	£1,140 5 11
E. Page, Cardiff	1,071 16 4

Accepted. [Borough surveyor's estimate, £1,011 3s. 5d.]

WORKING.—For the erection of three shops, Goldsworth Road, Woking, for S. C. Knight, esq. Messrs. W. G. Jones, M.S., and Clinton, architects and surveyors, 3 Broadway, Woking, Surrey:—

F. Aylott	£3,693	H. Ingram & Son	£3,140
Drowley & Co.	3,530	J. Harris & Son	3,000
W. R. E. Halse, Horse	3,475	A. A. Gale & Son	2,900
F. Kemp	3,439	G. Allard	2,700

Accepted. [Rest of Woking.]

The Norwich and District Master-Builders' Association held its annual dinner last week, the president of the Association, Mr. James S. Smith, occupying the chair.

Newport Power Station.—The tender of Messrs. A. S. Morgan & Co., of Godfrey Road, Newport, Mon., has been accepted for the power station buildings, chimney shaft and car and repair sheds for the Newport Corporation at the sum of £23,549 14s. 9d., subject to sundry modifications to reduce the cost somewhat. The firm has just completed the foundations contract at £8,547 7s. 3d. The whole of the buildings are to be faced with red pressed bricks with dressings of Bath stone, the latter being in lieu of terra-cotta originally specified. It is expected that the whole of the works will be completed by January next. The engineer for the work is Mr. H. F. Parshall, of London; and Mr. Harry B. Measures, of London, has undertaken the architectural portion.

A New Board School at Willesden was opened in Salisbury Road last Thursday by Dr. H. G. Bonavia Hunt, chairman of the Willesden School Board. It is built of red bricks, with terra-cotta dressings, tiled roofs, and a large flèche of copper. There are on the ground floor seven infant classrooms, with large hall, cloak-rooms and teachers' rooms. On the first and second floors there are fourteen classrooms with a large hall with balcony on one side for entrance to classrooms on second floor; there are also cloak-rooms, master's room and teachers' rooms. The cookery and laundry centre for girls and manual instruction centre for boys are in separate buildings at the ends of the main building. The school is heated by hot-water from one large boiler. The architect is Mr. Laurence A.R.I.B.A. The whole of the work has been carried out by Mr. Drake, of Messrs. Cowley & Drake of Willesden Green. The same firm is now engaged on a similar school for the same Board. Mr. Knight was the clerk of works.

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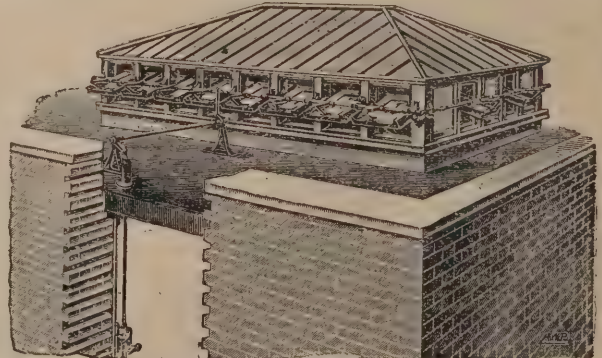
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Masters and Men.

Bradford Builders and Overtime Pay.—At the annual meeting of the Bradford Master-Builders' Association, Alderman W. Holdsworth was re-elected president. It was reported that a dispute had arisen in connection with payment for overtime on the new Bradford electricity works, which are being erected by day and night shifts, and a Conciliation Board was appointed to meet representatives of the men in accordance with the terms of the settlement of the recent masons' dispute.

The Peterborough Brick Trade.—There are indications of a general strike in the brick trade around Peterborough, and already the men at one yard to the number of fifty have struck. The workmen generally are greatly dissatisfied with the present rate of wages, and on the other hand the masters are not in a position to offer more favourable terms, as in order to compete with other makers in the London market bricks have to be sold at practically cost price. The men are aware of the fact that just now stocks are small and orders are large.

The Plymouth Masons are somewhat disturbed to find that the cut-stone for a new Board school is being brought all the way from Torquay. The apparent reason is that the contractor can procure the stone cheaper from Torquay, plus carriage, than it can be had from the quarries a few hundred yards away. A large employer of labour states that he has skilled masons working for him as labourers at 5d. an hour, because if they work as masons at all they are bound to be paid 8d. an hour, and that on most jobs now is a prohibitive price. Whenever possible, too, brick is being substituted for cut-stone. The allegation which is made against the mason's society there is that they are driving the stone-cutting work out of Plymouth.

Labour in February.—The Board of Trade reports that the general state of employment improved slightly during February. Compared with a year ago there is some improvement in the coal, iron and steel industries, but a decline in engineering, shipbuilding, building and certain other groups of trades. The general percentage of unemployed returned by trade unions at the

end of February, though higher than a year ago, is lower than the mean percentage for February during the past ten years. Employment in the building trades has fallen off to some extent. The percentage of unemployed union members among carpenters and plumbers at the end of February was 5.9, compared with 5.0 per cent. in January and 5.2 per cent. in February of last year. Eighteen fresh disputes began in February, involving 6,950 workpeople, of whom 6,400 were directly and 550 indirectly affected. The corresponding number of disputes in January was thirty three, affecting 23,558 workpeople, and in February 1901, twenty-five, affecting 6,945 workpeople. The changes in wages reported during February affected 111,751 workpeople, and the net effect of all the changes was a decrease averaging 3d. weekly per head. Of the total number, 1,211 received advances and 110,540 sustained decreases.

COMING EVENTS.

Wednesday, March 26.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at the East London Water Works, Lea Bridge Road, Clapton, at 3 p.m., conducted by Mr. W. B. Bryan, M.I.C.E.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Meeting).—Mr. David Beveridge on "Sir John Vanbrugh and his Work," 8 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Quarterly Meeting of the Directors at 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

CHEMICAL SOCIETY.—Annual General Meeting.
DEVON AND EXETER ARCHITECTURAL SOCIETY (Plymouth, Devonport and Stonehouse Branch).—Mr. A. S. Parker, A.R.I.B.A., on "Building By-laws," 8 p.m.

Thursday, March 27.

LEADS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. J. Starkie Gardner on "Decorative Wrought Ironwork," 6.30 p.m.

Wednesday, April 2.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. James Millar, I.A., on "The Glasgow International Exhibition of 1901," 8 p.m.

Thursday, April 3.

CIVIL AND MECHANICAL ENGINEER'S SOCIETY.—Mr. E. Ault on "Ventilation of Sewers," 8 p.m.

Friday, April 4.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. E. Worth, M.I.C.E., on "Sewerage."

INSTITUTION OF JUNIOR ENGINEERS.—Mr. G. Drydale Sweetman on "Notes on Modern Lighthouse Construction," 8 p.m.

Saturday, April 5.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to the Larder Technical School, Dunfermline.
BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at Carpenters' Hall, E.C., at 6 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at the Sewage Outfall Works, Barking, at 3 p.m., conducted by Mr. John E. Worth, M.I.C.E.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Annual General Meeting at 7.30 p.m.

Monday, April 7.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. E. Worth, M.I.C.E., on "Sewage Disposal," 7 p.m.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. W. Aumonier and Mr. Heywood Sumner on "Inlay and Marquetry," 8 p.m.

SOCIETY OF ENGINEERS.—Meeting at 7.30 p.m.
BIRMINGHAM AND DISTRICT CLERK OF WORKS' AND BUILDERS' FOREMEN'S ASSOCIATION.—Mr. W. H. Whitehouse, A.M.I.C.E., on "The Great Pyramid," 8 p.m.

Tuesday, April 8.

SOCIETY OF ARTS (Applied Art Section).—Prof. Bressford Pitt on "Street Architecture," 8 p.m.

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lating a much greater scheme for the develop-
ment of Washington, a scheme which, so far as
landscape architecture is concerned, is more
magnificent than any carried out in recent times.
Washington has very deservedly been called the
City of Magnificent Distances. Its plan is un-
doubtedly the finest which the United States
possesses, thanks to the genius of that young
French officer, L'Enfant, who was so admirably
suited for collaboration in the great projects of
Washington and Jefferson. Some time ago a
committee composed of the two foremost of
American architects, a noted landscape architect
and an eminent sculptor was selected to evolve
a scheme for the development of Washing-
ton on a scale compatible with the glory of the
nation; and after most thoroughly investing
the matter and spending a summer tour in
Rome, Venice, Vienna, Buda-Pesth, Frankfurt,
Berlin, Paris and London—thus embracing the
whole of European effort—they have produced
a remarkably fine plan, both as regards
practical workability and artistic merit; and
though it is impossible to describe in words
the effect of their scheme, some particu-
lars may be given from which at least
some idea of its grandeur can be gained.
It is proposed, then, to make the Mall of a
uniform width of 1,600ft. throughout its entire
length, and the axis of the Capitol and the
Washington Monument is to be defined by an
avenue a mile and a half long and 300ft. wide,
with elms planted on either side, four abreast.
The cross axis of the Mall, forming a thorough-
fare between the body of the city and river-
front, will be laid out as a garden, and areas
adjacent to the Mall and averaging more than
400ft. in width from the Capitol to the Washing-
ton Monument are set aside as sites for the
museums and buildings devoted to scientific
purposes; while the unsightly railway terminus,
which is now in the Mall, will be removed to
another portion of the city. Not only will the

Monument thus be brought into the Capitol
vista, but the Mall will be restored to its original
use as a grand setting for the two great buildings
of the nation, the Capitol and White House. To
the distance of a mile and a half from the
Capitol to the Monument the reclamation of the
Potomac flats adds another mile, giving oppor-
tunity for an extension of the treatment accorded
the Mall and also of a new and great memorial
to Abraham Lincoln, to stand on the axis of the
Capitol and Monument, near the bank of the
Potomac; the proposed memorial consisting of
a portico of Doric columns 250ft. long by 220ft.
in width. In addition, a broad paved quay or
landing space will skirt the Potomac, and thence
a memorial bridge is proposed to be erected at a
cost of £3,000,000. Connecting the Washington
Monument and the Lincoln Memorial will be a

in Washington one of the most beautiful and
complete of the cities of the world.

Ceilings.

WE have very much to be
thankful for as regards our
ceilings; in fact these are the most uniformly
pleasing feature in the generality of modern
houses. The reason is that they have been kept
entirely plain and white. One may go into a
house of wretched design, and the walls may be
covered with the most atrocious wallpaper, yet
the ceiling is the one redeeming feature. Its
even undecorated surface is a relief from the
fussy ornamentation that may be present in
every other part of the house. Latterly, how-
ever, there has been a decided tendency to
encroach, and though a decorated ceiling is not
an evil *per se*, yet the tendency is one that needs



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HENRY T. HARE, F.R.I.B.A., ARCHITECT.

canal 200ft. wide and 2,300ft. long, similar to
those at Versailles and Fontainebleau. West of
the Monument it is planned to place a garden,
which will create an axial relation with the
White House, this being accomplished by a
sunken garden framed in by tree-bearing
terraces in the shape of a Greek cross; the
centre being marked by a great pool, with rec-
tangular basins and a flight of steps 300ft. wide
leading from the garden to the base of the
Monument; and the whole scheme embodying a
wonderful array of fountains. It is evident from
these particulars how splendid the conception
is. The cost will be enormous, but this will
be no stumbling-block to our wealthy cousins:
and as there seems every probability of the
scheme passing Congress we may hope to have

to be watched very closely in view of the prob-
ability that the "decoration" will spoil and not
enhance the ceiling. A tinted plaster cornice,
with perhaps a coloured frieze below, can be of
most excellent effect, and it would be well if the
decorator stopped at this; but he rather inclines
to either paper the ceiling with a great pattern
or to cover it with heavy modelled work: both
of which methods defeat their object. As to
painted ceilings, in nine cases out of ten these
are an abomination: they require that the
painter shall almost lie on his back to execute
them and they strain the neck and eyes of those
whose misfortune it is to view them. No ceiling
decoration should be intricate: if there is any at
all it should be sufficiently uninvolved that the
eye embraces it at once and without effort.



TEMPLE OF CONCORD, GIRGENTI. DRAWN BY F. HAMILTON JACKSON, R.B.A.

SICILY AND ITS ARCHITECTURAL MONUMENTS.—V.

By F. HAMILTON JACKSON, R.B.A.

(Continued from p. 36, No. 369.)

ONE may go from Syracuse to Girgenti by two routes; either southwards to Noto, Modica, Ragusa and Licata, whereby many ancient sites are passed, such as Camarina, Gela (now Terranuova), Phintias (now Licata) and the others named, all of which are ancient—but this route has the inconvenience, to those who are at all pressed for time, of there being no through trains; so that the traveller is obliged to stay for the night at one of two or three places none of which possesses a tolerable hotel, for the Sicilian hotels are for the most part much behind those of the rest of Italy. The other way is to return to Biccoca, a short way from Catania, and take the Palermo express, which has a carriage or two attached to it for Girgenti. The line runs up the valley of the Dittaino, which is scarcely as interesting in the way of scenery as some of the other valleys or the coast lines, and after passing Catena Nuova, where great heaps and blocks of sulphur lie about the station, and from which Centuripe is seen picturesquely perched on its hill with Etna behind, it ascends rapidly. After passing Leonforte the valley of the Dittaino is left, the ascent being extremely steep towards Castrogiovanni (the ancient Enna) and Calascibetta, which frown across the valley at each other, seated on their lofty hill sides. The mountain scenery at this part of the route is superb and the line shows great engineering skill. Beyond S. Caterina Xirbi, where the Palermo train drops the carriages for Girgenti, is Serradifalco, the place from which the great Sicilian archaeologist

took his ducal title. The line descends after passing Canicatti, and at Aragona Caldare joins that from Palermo to Girgenti, which lies seven miles to the south. Along this line the headquarters of the trade in sulphur may be said to be established, one-sixth of that mineral being shipped at Porto Empedocle, and at Comitini Zolfare, three stations from Girgenti; the whole air smells sulphureous.

Girgenti is the Akragas of the Greeks and the Agrigentum of the Romans. In the Middle Ages it was the seat of the most richly endowed bishopric in Sicily, which was considered the first in importance, a position which it retained for a long time. The modern city occupies a part of the ancient acropolis only, but sufficient traces of the ancient walls remain to enable one to realize how large a place it was in its prime. The great temples are the principal attraction at Girgenti, but the situation of the town is superb, and the view from the promenade below the "Rupe Atenea" stretches far and wide over hill and plain, over cape and sea, and is splendid whether seen when the mists of early morning half hide the opalescent distance, at midday when the blue African sea enforces the brilliancy of the sunlight upon the yellow rocks and earth, or by evening light when all the colours are mellowed and blended against the lovely sunset sky.

The temples stand on the edge of a precipice which gradually declines to the Porta Aurea, in the following order. At the easternmost point, overlooking the watercourse now called Fiume S. Biagio; but anciently Akragas, stands the temple of Juno Lacinia, next that of Concord, followed by that of Hercules, between which and that of Jupiter the road to the Porta Aurea passes. Beyond are those of Castor and Pollux and of Vulcan, which look down on the ravine of the Drago, anciently the Hypsas. Besides

this magnificent range there are the remains of a temple in the city, believed to be those of the temple of Jupiter Polieus, and beyond the "Rupe Atenea" the Norman church of San Biagio is built upon part of that of Ceres and Proserpine. Cavallari, however, thinks this was a temple to Akragas, and connects it with a statue of a beardless youth found in the valley below, and now in the Communal Museum under the name of Apollo. Nearly all these names are conjectural.

The temple of Juno is a peripteros hexastylus with thirty-four fine Doric columns, which have twenty flutings. Their height is five times their diameter, and twenty-five of them are standing; the remaining nine, which have been re-erected, have only half their height. At the eastern end is a little terrace reaching to the wall of the town, upon which statues probably stood, or votive tripods, or perhaps an altar for use on great festivals when the concourse was greater than the temple would hold. The temple of Concord is very well preserved, perhaps because it was converted into a Christian church in the middle ages, at which time the arched openings in the walls of the *cella* were made. It is of the same kind as the last named but much more complete, retaining its pediments at both ends. In the rocks below, outside, are Christian tombs, and an early catacomb is passed on the way to the temple of Hercules. The remains of this are slight, though it is interesting as being thought to be the oldest of these temples. It had thirty-eight columns, and both in the remains of decoration on the plaster coating discovered by excavation, of fragments thrown down by the Carthaginians, and in certain peculiarities of plan it resembles the most ancient of the temples at Selinunt. From this shrine Verres tried to steal the statue of Hercules by night, but his slaves were repulsed by the

citizens who rose in defence of their property. Here too, it is said, was kept the painting of Alcmena by Zeuxis, and from this spot the statue of Esculapius, now in the museum at Palermo, was taken. The Porta Aurea, marked by the modern road which still follows the ancient direction, is the gate by which the Romans entered in 210 B.C. At the other side are the custodian's house and the temples of Jupiter and Castor and Pollux. The former was never completed. Erected in the fifth century B.C., its special peculiarities were the colossal telamones, 25ft. in height, one of which has been reconstructed on the ground, and the huge engaged columns, each 20ft. in circumference, with flutings broad enough to allow a man to stand in each, as they say, but which only measure 18in. across. Down to 1401 a considerable part of the temple was in existence, but it has since been used as a quarry, the modern mole at Porto Empedocle having been the last use to which the stones have been put. A little further on is the temple called that of Castor and Pollux, consisting of four Doric columns with a portion of entablature, re-erected by M. Cavallari from the remains of two different buildings. Here and on others of the temples are distinct traces of stucco and colour, the stone used for building them being a porous, yellow, fossil limestone which bears the ravages of scirocco badly. The remains of the temple of Vulcan situated in a garden a little farther on are insignificant. Outside the walls are the remains of two or three other antique buildings—the so-called tomb of Theron; a later building of Roman date, the mixture of Ionic and Doric details showing a period of decadence; the temple of Esculapius; small remains built into the wall of a house supposed to date from 420 B.C. from the fact of the columns being engaged like those of the temple of Jupiter; and portions of a Greek house which have been uncovered, with several mosaic floors.

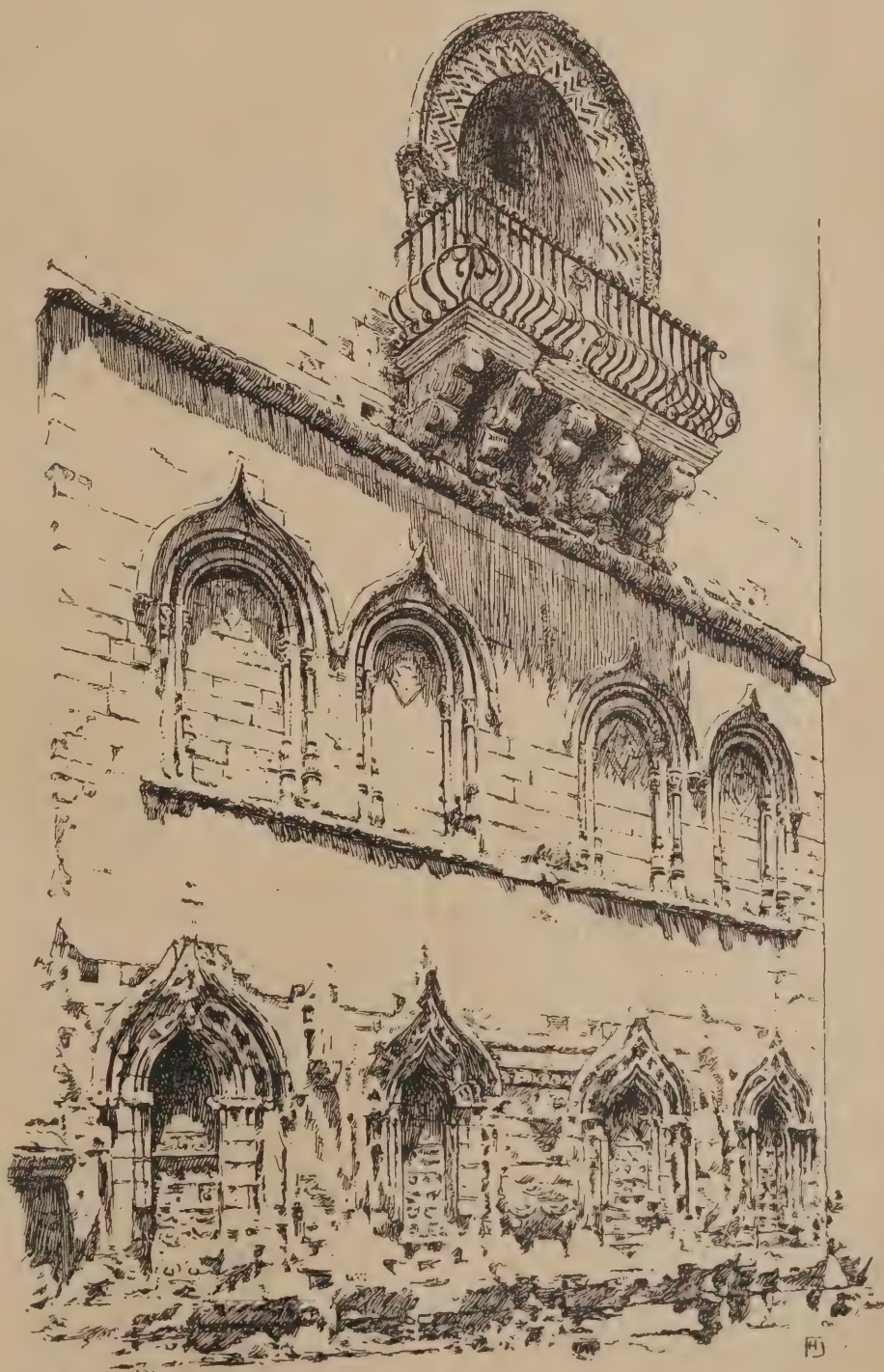
An interesting building is passed on the way to the town from the temples, the church of S. Nicola, built in Norman times, partly with ancient material and on part of an ancient site. Behind the high altar is a little courtyard with a heavy cornice and rude painting on the frieze below, similar to the cornice on the façade, which appears to be ancient material; the side walls have an arcade of a flat curve supported by piers with curious projecting mouldings half-way up, recalling a Roman podium. The roof is a barrel vault of pointed section with chamfered ribs above each pier. The wall against which the high altar is set has above it a row of round-headed niches, separated by small corbelled-out columns and occupied by frescoes which are dated 1574, but look at least a century earlier. The great doorway has an archivolt with fine bold mouldings and the door is panelled in an unusual and effective manner. The back of the church is in the Panittieri garden, which also contains some interesting architectural remains in a picturesque setting. These consist of a beautiful Corinthian cornice, built in at the top of a bastion-like tower which is part of a reservoir and relieves finely against the stone pines and other trees near, and the so-called Oratorio di Falaride, the *cella* of a Roman temple, which is perfect up to the triglyphs of the frieze, converted into an oratory in Norman times, the interior having been vaulted and a two-light window inserted (now built up), while a pointed doorway has been cut in the façade below the original architrave, which still remains. Cavallari excavated to the east of this building and found foundations and columns of a portico, which showed that the temple was tetrastyle and prostyle; but these remains have disappeared.

In the town there are three highly interesting things to see—the cathedral, the ruined church of S. George and the church of S. Maria dei Greci, which is believed to be built upon the ancient temple of Athene. The two temples of Jupiter Polieus and of Jupiter Atabyrius are thought by Schubring to be one and the same and to have occupied the summit of the acropolis, where the cathedral now stands. This still has the original campanile of the fourteenth century, battered and weatherworn, but picturesque and individual. The persistence of Norman decorative details till this late date is curious. The interior has been modernized with abundant stuccoed details. It contains in the Sala Capitolare a very beautiful marble sarcophagus carved with subjects from

the story of Hippolytus and Phædra, and some well-heads which were in the cathedral, beneath which there was once a large cistern. Many documents of the Norman period are preserved in the archives, and according to an Italian account there is a letter from the devil (!) preserved in some part of the cathedral, but the sacristan did not offer to show it to me. For the temple which stood on this site Phalaris collected building material and persuaded the Agrigentines that in order to keep it safe it was well to have a wall built round the place and guards set—by which stratagem he provided himself with a citadel and with soldiers by means of which to fix his yoke upon their necks. The doorway of the church of S. George is pointed and has Norman decorative details, the principal ornament being the well-known zigzag in several ranks, but with the addition of the dog-tooth and of more foliated carving than is found in England at that period. S. Maria dei Greci has thirteenth-century features about it—the west door, for instance—but the interior has been made up with plaster into late Renaissance forms. Some of the Greek columns are visible

in the side walls, but to see the steps of the base upon which they stand, and the lower part of six which are disengaged on the left, one enters a vaulted passage part of which is beneath the street. The "Rupe Atenea," called also "Colle Minervale," is thought by some to have been the site of the temples of Minerva and that of Jupiter Atabyrius, but Cavallari says that he has examined it carefully several times and cannot find any trace of the preparation of the rock for the foundations of a temple. The depression between the two elevations is said to have been cut by Empedocles to dispel malaria by making a passage for the north wind.

Girgenti, according to the Greek accounts, was founded by colonists from Gela in 582 B.C., but it appears pretty certain that this is the site of the Sicilian town of Camicea, though some place this town elsewhere, and Diodorus gives a tradition that when Sicily was invaded by Minos in pursuit of Daedalus he was received by the king of Akragas. Minos was contemporary with the earliest Greek civilization. Polybius says that the Rolioti coming to Akragas built there a temple to Jupiter Atabyrius, which some very



LOWER PART OF CAMPANILE, CATHEDRAL, GIRGENTI.



CHURCH OF S. NICOLA, GIRGENTI.

ancient coins seem to support, proving an immigration of the Lindii, bringing with them the worship of the Moloch of Mount Tabor. The brazen bull of Phalaris probably had some connection with this cult. This tyrant apparently resembled some of the Italian princes of the Renaissance in his cruelty, unscrupulousness, love of art and of learned men, and has had the most varied characters given to him; most of the older writers painting him as a cruel and licentious tyrant, while Lucian and others held a much better opinion of him. The period of the greatest prosperity of Akragas was perhaps that while Empedocles lived there, who persuaded the citizens to have a popular government, beat down the dangerous oligarchy of the rich, and reformed the laws, though the great extension and beautifying of the city was the work of Theron, after the battle of Himera in 480 B.C., when the Carthaginians were defeated and great booty gained by the allied Greek cities and thousands of prisoners taken as slaves. Splendid aqueducts were then made, some of which are in use at the present day.

The accounts of the splendour and riches of the citizens are fabulous. Empedocles said of them that they built as if they were to live for ever, but feasted as if they were to die on the morrow. It is recorded that on the occasion of a certain marriage 800 carriages and innumerable riders brought the bride home at night while the whole city was illuminated. A certain Exainetos won the 200 yds. race at Olympia and when he came home 300 chariots went out to welcome him, each drawn by a pair of milk-white horses. During the Carthaginian war a decree was issued forbidding a soldier on the march to be provided with more than *two mattresses, two pillows* and a blanket. In the gymnasium the utensils were made of gold. At the door of Gellias, a rich man of the city, stood slaves all day long to invite every passing stranger to rest and refresh himself; and once, in

winter, when 500 riders came from Gela, he took them all in, and in addition presented each man with new garments. In his cellars, instead of casks and hogsheds, he had 300 reservoirs for wine hewn in the solid rock, each of which held 100 amphoræ, which is nearly equal to 900 gals. When the city was taken by the Carthaginians this Gellias collected such of his treasures as he could gather together quickly, and with his family retired into the temple of Minerva and set fire to the place, saying that he thus avoided three evils: "The impiety of the enemy towards the gods, the rapine of the sacred riches, and the murder which they would have committed on himself and his family." This was in 406 B.C., when the Carthaginians were led by Himilco. In two or three centuries they reduced its magnificence into a field strewn with ruin; and though it appeared to recover somewhat in the time of Timoleon and took some part in the first and second Punic wars, suffering sieges from both sides, it disappears from history after 207 B.C., when it became finally Roman. In 828 the Saracens took it, the city and surrounding district becoming the headquarters of the Berbers, a race the peculiarities of which may still be recognized in a type of face frequently met with in Girgenti. Rebelling in 937 against their power, after three years it again had to submit, and a severe famine was the result of the struggle. In 1089 it was taken by Roger and his Normans, and four years later S. Geffando was appointed to the bishopric.

The whole of the rock under the modern city is pierced by galleries and chambers into which one may descend at several points. The principal entrance is by the side of the church in the Piazza del Purgatorio. It is disputed whether these were quarries from which the stone of which the city was built was extracted, or places of refuge, or caves in which the earliest inhabitants of Sicily dwelt before they began to build on the surface of the earth. It appears most likely that they were connected with the defensive works of the

city when it was confined to this upper part, and are therefore Sicanian. The Greek city stretched over vineyards and oliveyards, covering a district still known by the name of "Civita," while the famous fishponds are thought to have been in the hollow between the temples of Vulcan and Castor and Pollux. Akragas was called by Findar "the most beautiful city of mortals," and he who studies its remains and tries to reconstruct its magnificence, set in the beautiful landscape which still surrounds it, may well believe the expression justified.

(To be continued.)

SCAFFOLD ACCIDENTS.

A SHORT time ago the Home Office issued the following reprint (with some additions and modifications) of a report which appeared in the annual report of the Chief Inspector of Factories for 1900. The modifications introduced have been made upon the suggestions of leading experts who have been consulted. A special abstract summarizing the provisions of the Factory and Workshop Act, 1901, so far as they apply to buildings in course of construction, will be supplied on application to the Home Office (Factory Department), Whitehall, S.W.:-

The dangerous conditions in building operations may be divided into two classes—(a) those arising from imperfect scaffolding, and (b) those arising from the lifting and carrying of material.

Scaffolding.

The two principal methods are known respectively as the north- and south-country systems. The northern, as the name indicates, is principally used in Scotland and the North of England, although of late years it has also found favour in the South; the other method (see Fig. 1) is essentially the south-country system.

The first method is invariably used in conjunction with power, generally a steam crane. When one crane only is necessary it is fixed upon a triangular platform built upon three legs, one at each angle, and is raised to such a height as to be well over the building to be erected. The crane stands over the principal or king leg. Owing to the guys it cannot make a complete revolution. If power is required that can be utilised on all parts of the building, the erection has a square platform with a leg at each angle, and two cranes are then fixed, being placed diametrically opposite to each other. The three or four legs, as the case may be, are of framed timber, bolted, and are weighted to the ground by masses of brickwork. The whole is so well built that accidents occurring through faults of construction are extremely rare. The greatest dangers arise when the crane is imperfectly fixed, and when the weight of the crane engine and load is too much for the king leg on which it rests, and when the legs are not sufficiently far from the king leg.

With regard to the first point, the guys of the crane should always be carried to the centre of the secondary legs and chained down to the masses of brickwork which weight these legs at their feet. This chain requires frequent examination, especially when a heavy load is being raised, as owing to the vibration of the scaffold it becomes loose, and if not tightened the crane would lose its rigidity and accidents would be likely to occur. In the second case, where the weight is great, the king leg should have an additional central upright running from top to bottom (see Fig. 2, which is a plan of a king leg).

The second form of scaffolding presents many points of interest. In order to render this report more intelligible, notes are given on Fig. 1 which explain the technical terms used. There are two varieties also of this form of scaffold and their use depends upon the material of which the building is being constructed—brick or stone. Where bricks are in use, one row of standards and ledgers only is necessary; the putlogs resting outwardly on the ledgers and inwardly on the wall (where header bricks have been left out for their reception). On stone buildings, and more especially when ashlar fronted and where an opening in the wall would leave a permanent disfigurement a double set of

standards, &c., is necessary to carry the putlogs (see Fig. 3, which is a section of what is known as a mason's scaffold).

The different marryings, tyings, &c., should be carefully watched, as scaffolds have been known to come down owing to the cords slipping. This happens more especially when cords have been used damp, the influence of a hot sun causing them to relax considerably. Wedge-driving between cords and posts is the usual method of tightening. The boards on which the men work should be carefully kept in position. Fig. 4 shows the usual position of the boards. Carelessness may and does result in these losing their place, and if by so doing they take the position shown on Fig. 5, what is known as a trap is formed. Fig. 6 illustrates the working of a trap. It will be noticed that when on the boards it is not easy to tell where the putlogs are. This to a great extent creates the danger. A certain preventive would be for the putlogs to be used in pairs; the boards then, instead of overlapping, could be placed end to end (see Fig. 7); in overlapping, boards get out of place and a second man of two may catch his toe against the end raised.

Two of the commonest forms of accidents occur on these scaffolds—the falling of the workmen, and the dropping of the material from the upper floors of the erection. On the outside of the scaffold, also at the ends, a guard-rail should be lashed to the standards about 3ft. 6in. above the scaffold boards. This would obviate the first danger. With regard to the second, the danger from falling material is much to be deplored, as though it can occur in many ways it is as a rule the result of great carelessness. A board on edge running along the outside of the scaffold, but within the uprights and nailed to them and again at the ends, would to a great extent prevent this class of accidents. Unfortunately, this board cannot be fixed on the inward side of the scaffold, as it would interfere with the free use of the workmen's tools. Figs. 1 and 3 show the guard-rail and board on edge.

A mason's scaffold should be supported in such a manner that no opportunity could occur for it to fall away from the building. Fig. 3 shows the shoring which is the usual method of preventing this where room permits—but this cannot be applied in a street, and in that case the scaffold should be tied to the inside of the buildings by poles through the openings.

There are other conditions of risk involved in insufficient width of runs, and in the use of centering improperly supported. A run is commonly seen only one board wide (9in.). It is needless to say that this width is dangerous: 18in. is the least that should be allowed. A run for continued use would be better made of two 3in. by 11in. planks, if two planks are used. A slip of wood can be nailed across the undersides to keep them together. Fig. 8 is a plan of a working platform surrounding a courtyard or well, and gives three examples of runs which are commonly used, but which are not satisfactory. Improperly supported centering is seen only in cheap work. Figs. 9 and 10 illustrate what is meant. It will be noticed that the supports to the centering of Fig. 9 are kept in their position entirely by the lateral pressure exerted by the stay A. It follows that if this pressure is eased sufficiently, say by shrinkage, it is more than probable that the centering and a large portion of the unfinished arch would fall. Fig. 10 shows the centering properly supported. All supports to centering should rise from a solid foundation. Painters' boats occasionally fall owing to the use of defective cordage and supports. Care is the only remedy that can be suggested. Ganties (especially those erected over the public way) having to carry great weights should be effectively strutted and braced, and timber of sufficient strength used.

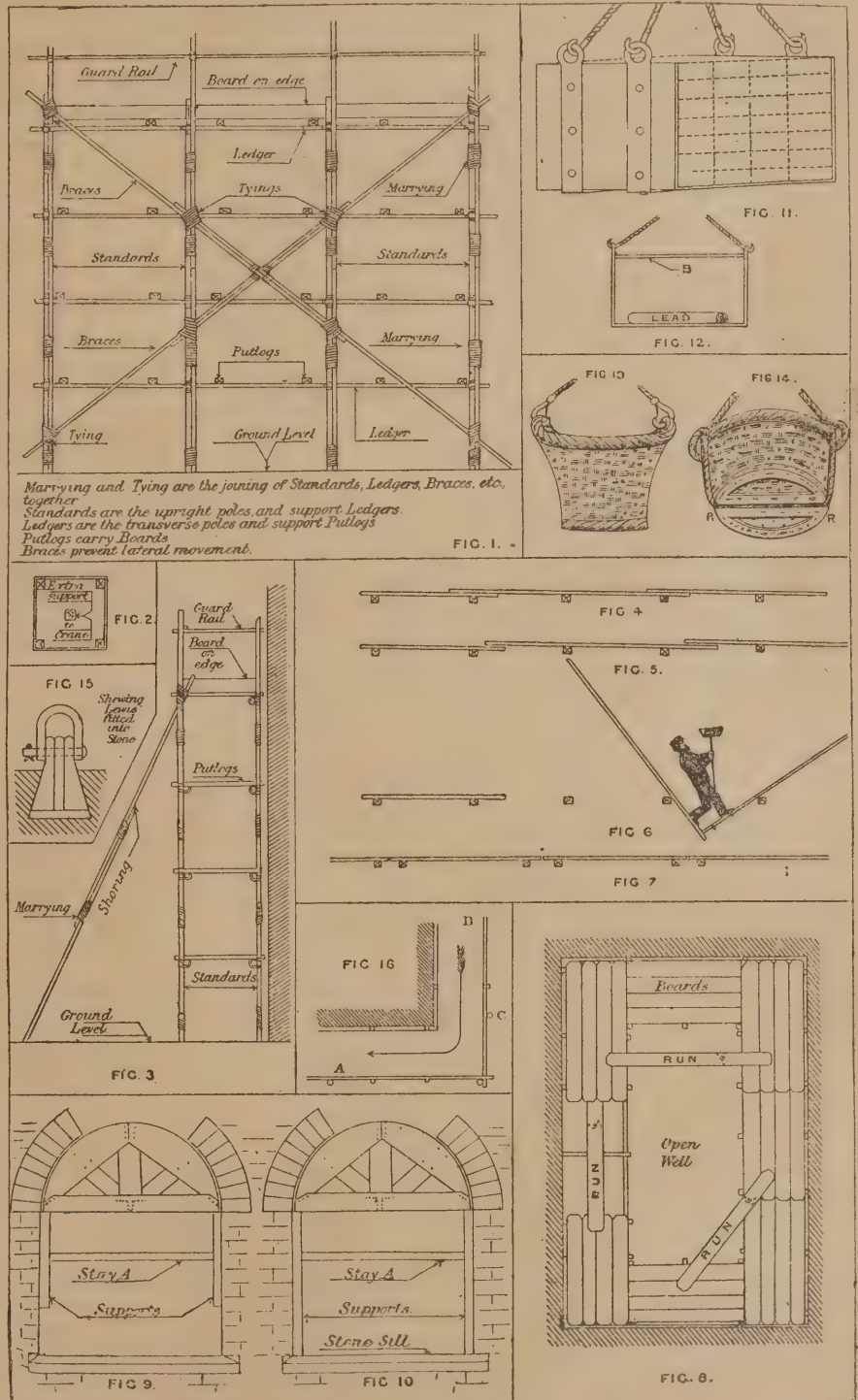
Lifting and Carrying Material.

Very little danger arises during the lifting and carrying of material so far as the power in use is concerned. The accidents generally occur owing to the defective manner by which the material is secured to the crane, pulley wheels, or whatever the arrangement for lifting may be.

Ironwork.—Ironwork is principally used in the form of girders or columns. These are sometimes slung by a chain round the middle and as evenly balanced as may be. There is considerable danger of this chain slipping, how-

ever well balanced (more especially if the load when swinging is tilted, say, by receiving a jar through touching some part of the erection), and thus allowing the material to fall. To prevent this a second chain may be run from each end of the column or girder to a point some distance up the supporting chain, but the best remedy is a "softener," i.e., an old bag or sack put round the ironwork first, and the chain turned twice round it over the "softener" and knocked as close as possible; then no slipping will take place. The same applies to timber.

the ends to take an inward slope. If the crate is tightly packed this pull creates a pressure on the material and tends to keep it in position, but if loosely packed the absence of sides would be a source of danger, as the material could easily fall out. If a similar crate were used to carry a roll of lead, it would be necessary to place a stay (B, Fig. 12) across the top to counteract and relieve the strain at the bottom. When baskets are used, the danger lies in the handles. If they are hooked to chains, which is the usual method (Fig. 13), the weight may, and



Timber.—Timber in lengths can be carried in the same manner as the iron girders, but owing to the greater friction set up between wood and iron it is not so likely to slip as the former. The same precautions, however, are necessary.

Bricks, Slates, &c.—Bricks, slates, &c., in large quantities are slung in crates, in smaller quantities in baskets, and in small work are carried in hods by labourers. The crates (Fig. 11) will carry as many as 350 bricks. It will be noticed that they are not fitted with sides. This is to facilitate loading. The chief danger arises from their use when they are improperly packed. When suspended the pull on the handles causes

does, cause them to give way. One remedy is for the chain or rope to be carried round the basket, as shown in Fig. 14. The pieces of wood marked "R," if fixed as shown, would give the basket a level bottom and would also tend to prevent the rope slipping. A better course would be so to construct the basket that the material of which the handles are made should be carried down the sides and along the bottom of the baskets and well secured there. In any case care should be taken to see that the baskets are strong enough in the first instance, are kept in proper repair, and not overloaded, and that spring hooks are used on the slings.

Stone.—There are several methods of lifting stone. It can be lifted in the same manner as ironwork, or may be suspended by means of a "lewis," or again by means of nippers. The first method is perhaps the safest, but is generally used for undressed work only, as the chain is apt to break up any finished edges, &c. As regards the second method a hole is cut into the stone wider at the bottom than at the top, three pieces of iron (as shown on Fig. 15) are fitted into it, the outside or splayed pieces first, and the rectangular centre piece last. A bolt running through the top of each fixes its position, and at the same time secures a ring into which the hook, by which it is to be lifted, is placed. This arrangement will lift a very great weight. They are made in all sizes to suit; the softer the stone the deeper they ought to be in proportion to the weight. The risk of its giving way if the stone is not free from vents, or when the lewis does not fit the hole, or again if the weight is not evenly distributed, is considerable. Its use with perfect safety can only be left to the judgment of the mason. The nippers clutch the stone on the outside. Danger may arise if the small holes picked out to receive the nippers are so near the top edges of the stone that the points drag out; or again, the centre of gravity may be above the points, causing the stone to turn over and fall. It is, of course, assumed that the plant in use has been both in point of quantity and quality (and the first is of equal importance with the second) fully sufficient. It is regrettable that often in actual practice this has been found not to be so. Inferior tackle has been and is responsible for many accidents. Many lives could have been saved if a little forethought had been used, and compliance made with those unwritten rules by which workmen should be guided. Fig. 16 will give a clear illustration of what is meant. A labourer, in building a scaffold, required a ledger at point A. He fetched it from point B. He carried it upon his right shoulder, and in turning the corner in the direction of the arrow the end of the pole struck against standard C. The recoil immediately knocked him off the scaffold. If the pole had been upon his left shoulder, the blow would have fallen harmlessly and his life would not have been lost.

Some Suggestions.

The following suggestions, if carried out, would tend materially to reduce the number of accidents occurring on buildings in course of construction or repair:—

(1) All working platforms above the height of 10ft. taken from the adjacent ground-level should, before employment takes place on them, be provided throughout their entire length on the outside and at the ends (a) with a guard-rail fixed at a height of 3ft. 6in. above the scaffold boards (openings may be left for workmen to land from the ladders, and for the landing of material); or (b) with boards fixed so that their bottom edges are resting on or abutting to the scaffold boards. The boards so fixed should rise above the working platform not less than 7in. Openings may be left for the landing of the workmen from the ladders.

(2) All "runs" or similar means of communication between different portions of a scaffold or building should be not less than 18in. wide. If composed of two or more boards they should be fastened together in such a manner as to prevent unequal sagging.

(3) Scaffold boards forming part of a working platform should be supported at each end by a putlog, and should not project more than 6in. beyond it unless lapped by another board, which should rest partly on or over the same putlog and partly upon putlogs other than those upon which the supported board rests. In such cases where the scaffold boards rest upon brackets the foregoing suggestion should read as if the word "bracket" replaced the word "putlog." (Experiments have shown that a board with not more than a 6in. projection over a putlog can be considered safe from trapping or tilting.)

(4) All supports to centering should be carried from a solid foundation.

(5) In places where the scaffolding has been sublet to a contractor the employer should satisfy himself, before allowing work to proceed on it, that the foregoing suggestions have been complied with, and that the material used in the construction of the scaffold is sound.

Engineering Notes.

The New Police Station at Prestatyn has been fitted by Messrs. John King, Ltd., of Liverpool, with their "small tube" hot-water apparatus.

The Westbrook Temporary Hospital, Herne Bay, is being warmed and ventilated by Shorland's patent Manchester stoves and special inlet tubes, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

The Whitechapel and Bow Railway, which has been under construction for the past three years, will be opened to the public on May 1st. The line connects the District Railway at Whitechapel with the Tilbury line at Bow, and will allow either steam or electricity to be used as the motive power.

The Harbour Works at Colombo.—An extensive series of important works is being carried out at the present time in the harbour of Colombo. These consist of two breakwaters, a graving dock, a slipway and a coaling depot. The sheltered area enclosed within the harbour will be about 660 acres, which will give to Colombo one of the largest artificial harbours in the world. The north-east breakwater, which is practically complete, is built of rubble *pierre perdue*, thrown into the sea with a base from 200ft. to 300ft. wide, with a width of 70ft. at the top and a height of 7ft. above sea-level. The north-west breakwater is constructed of concrete blocks about 30 tons in weight. The graving dock will be 600ft. in length on the floor, 121ft. in width at the copings and 85ft. at the entrance, with a depth of 30ft. over the sill at low water. The slipway will have a gradient of 1 in 20, and at the outer end will be covered by 25ft. of water. At that end, resting on a rubble bed, the sections of the platform have a framework of jarrah wood encased in concrete, but higher up, where the weight of the vessel will bear more fully as it is drawn out of the water, concrete work, based upon piles driven down to a solid stratum, is employed.

Correspondence.

The New Cowl Tests.

To the Editor of THE BUILDERS' JOURNAL.
CAPE TOWN.

SIR,—I am flooded with numerous pamphlets relating to the new Cowl Committee tests, presumably because my name has been mentioned in the report published by the Sanitary Institute. I wish to state that I do not agree with all the abuse that has been heaped upon the late Mr. Rogers Field; at the same time, Mr. Rogers Field and myself were not in accord as to how the experiments should be conducted or tabulated—hence my early departure as an assistant from his active efforts to unravel the mysteries of ventilation. I must explain that it was purely an accident that I became connected with these experiments, and that both before and after I left Mr. Field others were hard at work on the numerous problems, and did their duty conscientiously under orders received. Although the methods of testing were undoubtedly defective, I am sure that at some future date some one with ample time and funds will thank the Sanitary Institute and Mr. Rogers Field for so large a number of recorded experiments. The subject is a most difficult one, at the same time a very important one, and should not be howled down by interested manufacturers of cowls. Did you ever know a man who invented a pump for water or for air without declaring it the most efficient and economical in the market? After wading through more than 2,000 experiments conducted by Mr. Rogers Field I soon saw that the subject had a wider range, *i.e.*, the flow of air across such tubes and finials must follow some laws at present difficult to grasp but once mastered would also apply to river and harbour mouths, &c. I quite agree with some critics that the tests were made on too small a scale and, I may add, without proper precautions from a scientific standpoint: but to class them as totally valueless is at once rash and ungrateful. No man could have been more serious in his work than Mr. Rogers Field, and I am surprised no one has so far spoken a good word for him.—Yours truly, A. W. ACKERMANN.

New Patents.

These patents are open to opposition until May 5th.

1901.—Sinking Shafts for Foundations.—4,625. J. WILSON, Craighenall, Falkirk. The shafts are sunk by a hollow column formed with an armoured cutting edge at the bottom. This column is provided with a number of pipes down which fluid or gas is forced when the soil resists the downward pressure, being thus loosened so as to allow the column to sink. The loosened matter is sucked up by a central pipe.

Wallpaper Trimming Machines.—6,065. C. BÜTENBENDER, 15, York Place, Baker Street, London, W. The machine consists of two pairs of scissor-like shears which trim the paper at each side, the paper being automatically advanced after each cut. It is claimed that the device is simple and inexpensive.

Cheap Houses.—6,115. J. A. BRODIE, City Engineer, Liverpool. According to this invention houses for the poor are constructed almost entirely of concrete. The walls, floors and roofs are formed of separate concrete slabs completed at the works, and the edges have interlocking joints which are fixed with cement. The roof is flat, with the necessary slope to take off water, and the inside stairs are of concrete. The advantages claimed are cheapness, sanitary condition and rapid construction.

Bath Fittings for Asylums.—6,570. T. W. TWYFORD, Cliffe Vale Works, Hanley. The hot and cold water supply valves are of the ordinary screw-down type, but are so arranged that hot water cannot be let into the bath until the cold-water tap has been opened, and also the latter cannot be closed until the hot-water tap has been shut down, thus obviating any risk of scalding.

Hydraulic Rams.—7,340. R. RACKHAM, of Robert Warner & Co, Walton-on-the-Naze. This invention relates to rams of the suction-pipe type or those in which the waste water is conducted below the standing level of the tail water. The discharge valve has a horizontal hollow stem containing a spring, with holes for admitting air either to the suction chamber or to the body of the ram. The end of the horizontal stem works in a water tank having a screw plug for regulating the height of the water.

The following specifications were published on Thursday last, and are open to opposition until May 12th. A summary of the more important of them will be given next week. The names in italics are those of the communicators of the inventions.

1901.—4,345, SHARPLES, stop taps. 4,437, WILSON, blocks for arches. 4,457, WARD & WARD, water-supply cisterns. 4,500, WATKINSON, shower apparatus for baths. 4,702, HECHT & POULENC, manufacture of lacquers and varnishes. 4,466, HEAWOOD & HULME, metal rings for jointing pipes. 5,509, AXER, drying kilns. 5,895, WEBBER, windows. 5,970, TIMOKHOWITCH, ventilation of rooms and buildings. 6,350, STANLEY, manufacture of tiles. 6,481, BUTLER & HUNT, combined intercepting trap and flood valve. 6,837, SUTCLIFFE, hydraulic presses for slabs, blocks, &c. 6,868, PEGG & PEGG, gravel washing machines. 7,087, KAYE, locks or latches for sliding doors. 7,126, TEMPERLEY, TEMPERLEY & TEMPERLEY, wood or other block pavement and flooring. 7,768, BARTY, placing rope grips on aerial ropeways. 7,784, LE MAITRE, window sashes, casements, &c. 9,293, SCHMIDT, road-cleaning machines. 10,455, LAKE (*Confalonieri & Confalonieri*), floors. 12,272, LAKE (*Fried. Krupp Grusonwerk*), artificial stone blocks, &c. 18,163, SCHWARZ, machine for preparing materials for artificial stone. 21,972, WEBB, door checks. 25,213, FERGUSON, instrument for measuring and recording distances travelled and for surveying purposes. 26,074, BATES, taps. 26,434, GILBERT, mitre-planing machine.

1902.—505, MONNOYER, sinking and construction of wells. 1,293, HOSSFELD, means for preventing draughts. 1,324, COULSON, conveyor or transporter belt. 1,681, MITCHELL, pipe cutters. 1,842, SOMERS, fireplaces.

Views & Reviews.

Chronicles of the Tower.

The second volume of this work continues the chronicle of social and historical events in the Tower from the time of the Stuarts to the present day. It cannot be said that the volume possesses any essential architectural importance, though the study of the building as a palace, a prison, a law court and a barrack makes interesting reading. The conspicuous part in the national history which London's fortress has filled in the past is sufficiently and ably set forth; and the author's acknowledged skill in anecdotalism makes the assimilation of the facts both easy and pleasant. Of antiquarian value are the many views of the Tower reproduced from old pictures and prints, which relate, pictorially, its transition from a Norman fortress to a barrack almost as clearly as does the text in words. Executions have always exercised a morbid curiosity in human minds, and in the present volume this is evidenced by numerous reproductions from contemporary prints showing the infliction of the death penalty on the rebel Lords, 1746-7. Judging by the numerous well-filled stands, these dread events constituted important social functions. The need of the supervising hand of the County Council is shown in the illustration (facing page 130) of a stand collapsing at the execution of Lord Lovat, whereby—as we are told underneath—"above fifty persons lost their lives and were disabled."

In Appendix IV, under the title of "Recent Discoveries at the Tower" Lord Ronald Gower gives some valuable particulars of Roman work disclosed by the demolition of a range of buildings on the east side of the White Tower, believed to have been originally built in the fourteenth or fifteenth century, but which had been so patched and altered as to have lost all antiquarian interest. The building was entirely removed with the exception of those portions of the south walls and the ruins of the Wardrobe Tower which form the north wall of the Tower Armoury erected in 1826. It was during this work of demolition that Roman tiles and mortar were found worked up into the material of which these walls were built. "At the south-east corner, and adjoining the remains of the Wardrobe Tower, a portion of Roman wall was disclosed, having three courses of bonded tiles, showing above the surface of the debris. This piece of wall is in a direct westerly line with the old city wall, shown in a plan of the Tower, made in 1597." The author's inference from this discovery is that either the wall is part of the original Roman city wall, or it forms part of the remains of a Roman building, in which latter case it proves the existence of a previous Roman fortress on the site of the White Tower, always a contested point. Stowe's evidence that the Conqueror caused the present White Tower to be erected at the south-east angle of the city wall, which would be the actual spot where the fragment was found, points to the former hypothesis as the most probable. The Cradle Tower (the third tower on the southern side of the Ballium walls) has now proved to be the entrance to the Queens' apartments from the river, they having extended from the Lanthorn Tower to the south-east angle of the White Tower, and the space recently cleared formed the queen's private garden.

The author protests strongly against the hideous new guard-house which has been built close to the White Tower, and unfortunately announces further acts of vandalism proposed by the War Office. "It has been determined to build stores on the Queen's gardens, and consequently the loopholes in the old Ballium wall will be blocked up. The site will thus be lost for further investigation, and as the Office of Works has no power to prevent these works being carried out, all that has been exposed of one of the most interesting portions of the older part of the Tower will be lost." It is high time that the military should be bundled out of the Tower neck and crop. As an historical relic the Tower is of the highest importance; as a barrack and a fortress it is neither suitable nor necessary. Each year sees the policy of exclusion more rigorously carried out: not a quarter of the buildings open to the public twenty years ago can now be seen by visitors, who will soon be

restricted to the cloak- and refreshment-rooms—mediaeval relics it is true, but not quite so interesting as the buildings beyond. If Lord Ronald Gower's book can draw the attention of Parliament to the further vandalistic changes proposed it will have an additional merit to that of being an eminently readable history of the Tower.

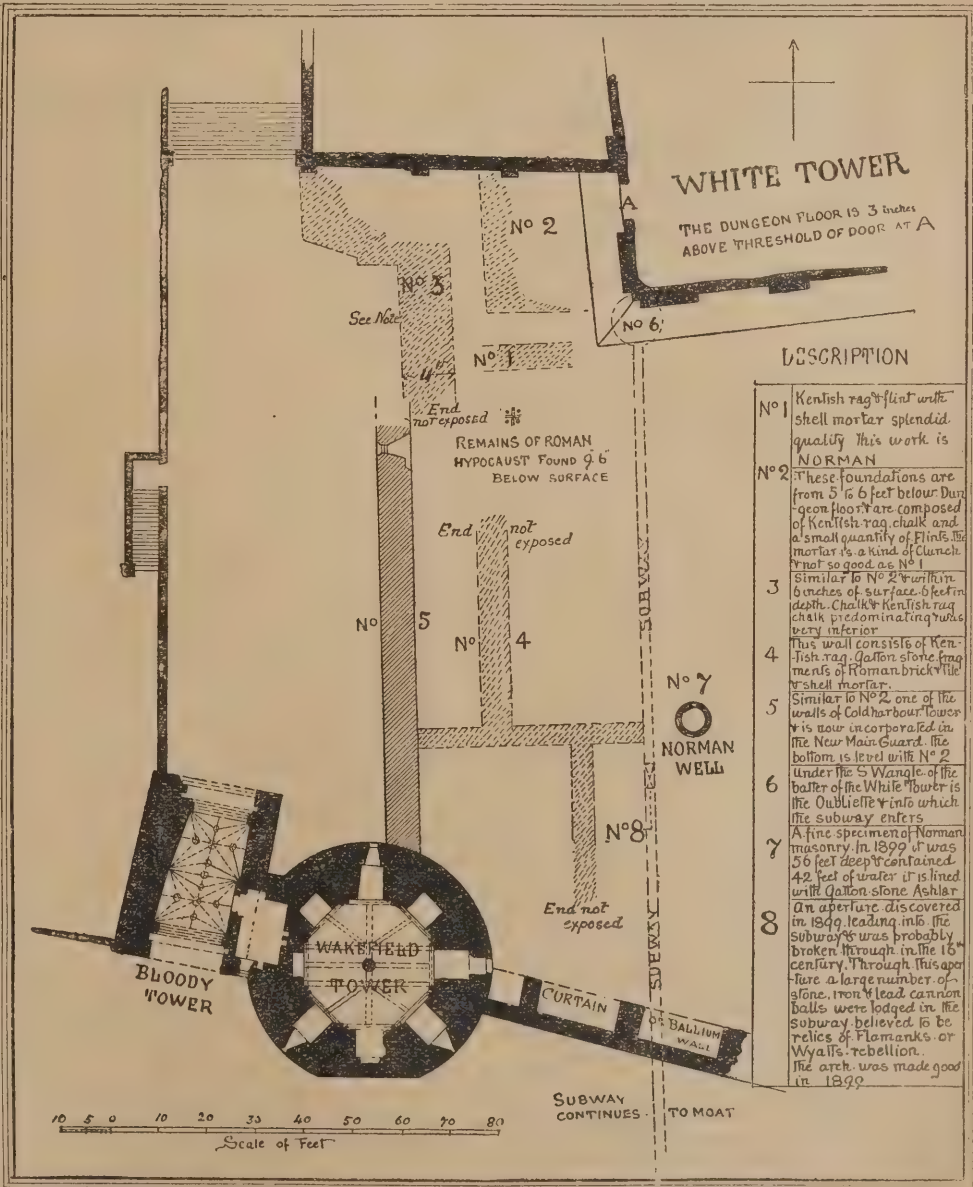
"The Tower of London—Vol. 2." By Lord Ronald Sutherland Gower, F.S.A. London: George Bell & Sons, York Street, Covent Garden. Price 21s. nett.

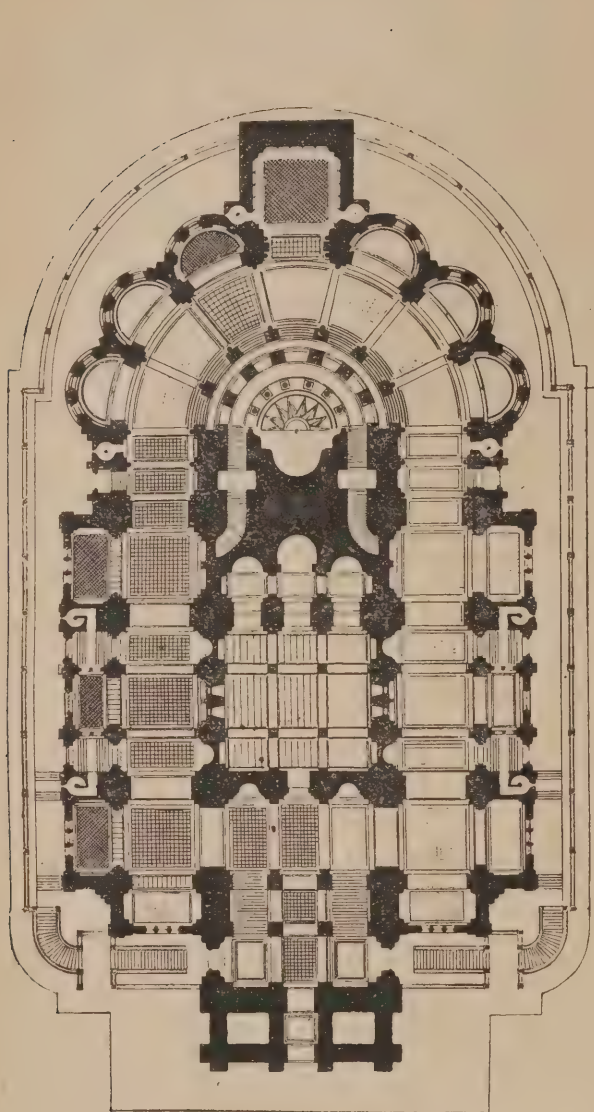
Masters and Men.

Birmingham Building Trade Dispute.—A committee appointed by a general meeting of the Birmingham Master-Builders' Association last week met the several branches of the operatives in consultation. Mr. Albert Smith (president of the Birmingham Master Builders' Association) acted as chairman, and representatives of the bricklayers, carpenters, masons, labourers, plasterers and plumbers were in turn interviewed. The masters proposed to reduce the masons' and plasterers' wages 1d. per hour, and reduce all other branches of the trade to 9d. per hour. In addition they asked for a uniform hour for beginning and ending work. A prolonged discussion took place upon the proposed alterations in the working rules, with the result that, with the exception of one or two points, the settlement of the matters in dispute was agreed to. As it is not proposed to reduce the existing rate of wages, it is confidently anticipated that no difficulties will be raised by the operatives to prevent a friendly settlement.

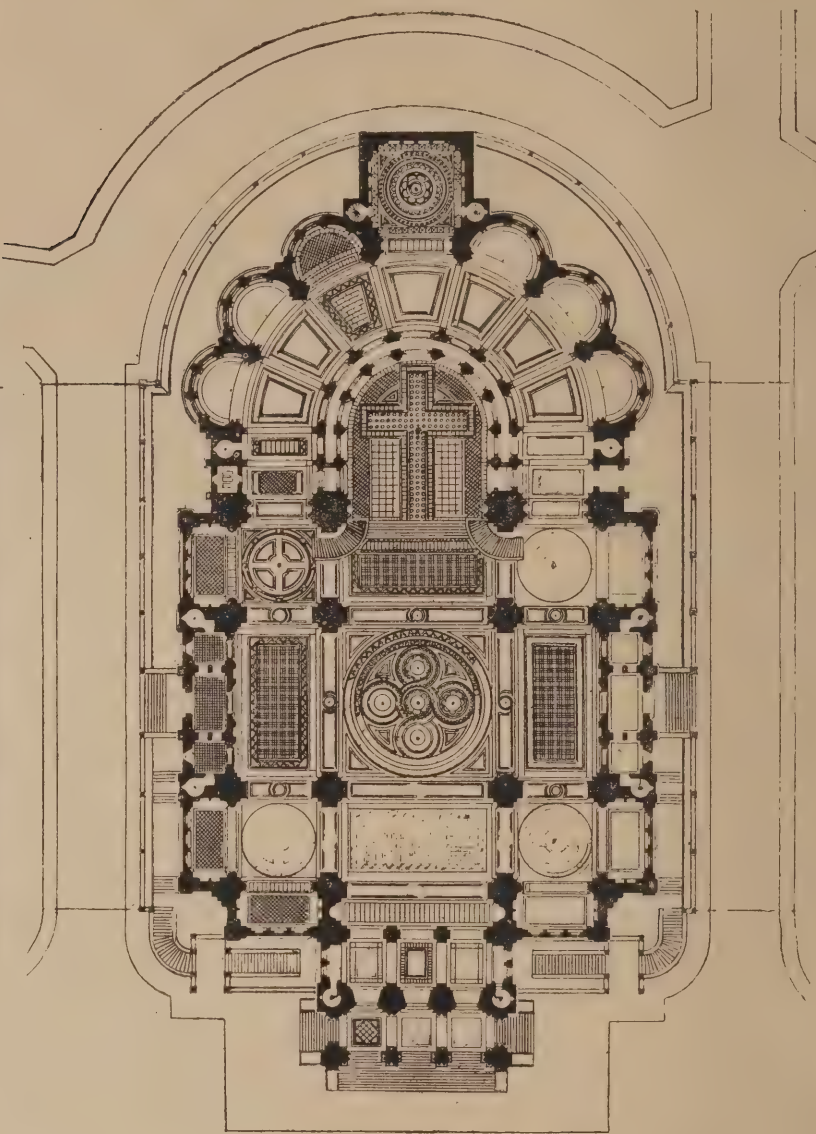
CORONATION DECORATIONS.

ON the suggestion of Sir L. Alma Tadema, R.A., who was called in consultation by the Westminster Council Committee, Mr. Frederick Vigers has been appointed to carry out the scheme of decorations for that city. It will depend upon the response which the appeal now being made for funds meets with whether Mr. Vigers's scheme can be carried out in its entirety, but in a rich city such as Westminster, and for such a purpose, it is scarcely conceivable that ample means will not be forthcoming. For the bulk of the route Mr. Vigers suggests an avenue of Venetian masts to be joined together by wreaths of red roses, with leaves and red celluloid balls, and bound together with yellow ribbons. The immediate neighbourhood of the Abbey will be fronted by columns painted white, each furnished with a trophy of his Majesty's arms surrounded by the Ribbon of the Order of the Garter, and ensigned with the Imperial crown. The columns will be connected by wreaths bound with white ribbon, and at the top of each, on a mound of blue glass, to contain electric lights, will be a golden winged figure playing a musical instrument. A notable part of the plan is the erection of triumphal arches representing Great Britain and Ireland, India, Canada, Australasia and Africa at various points on the route. The first will represent the Royal Family of England, by means of his Majesty's Coat of Arms set in a trophy of the banners of the Princes of the Blood; and Great Britain and Ireland by shields emblazoned in their heraldic colours. Figures of the patron saints will surmount the whole, which is to be draped with a golden cloth *sémé* of his Majesty's cypher in red.





PLAN OF CRYPT.



PLAN OF CHURCH PROPER.

CHURCH OF THE SACRED HEART, MONTMARTRE, PARIS.

THE CHURCH OF THE SACRED HEART, PARIS.

ADDITIONAL NOTE.

[As stated on p. 82 of our last issue, at the moment of going to press we received from M. Henri Rauline some additional particulars and illustrations of the Church of the Sacred Heart, Paris. These are now given.—ED. B. J.]

THE decision to erect at Montmartre the Church of the Sacred Heart was made on July 23rd, 1873, soon after which a competition among French and foreign architects was held, and the design of the late Paul Abadie was accepted from among those of seventy-eight competitors. The official ceremony of laying the foundation-stone took place on June 16th, 1875, and the work was begun in earnest a few weeks later. The nature of the ground, which consists of superimposed layers of clay, chalk and sand, made it very difficult to secure good foundations for the building, and in order to avoid any subsidences, which would have been fatal, eighty-five shafts were sunk to a depth of 34 metres below the level of the lower church, resting on a very thick layer of gypsum. These shafts, which were from 3 to 5 metres in diameter, were built up in rough masonry, with hydraulic lime, the total contents being 40,000

cubic metres. At the top the shafts were connected by large arches, on which the church rests; in addition to which the central shafts receiving the weight of the great dome were further strengthened by a bed of concrete 1 metre 20c. thick.

The church consists of two parts, the basilica proper and the crypt, the latter extending entirely under the former, so that its plan is practically the same. The crypt, which is 9m. 60c. high to the top of the vaulting, is largely lighted by windows overlooking a cutting which has been made all round. The basilica is 100 metres long and 50 metres wide, with a cupola in the centre 16 metres in diameter, at the rear of which the choir extends in a semi-circle: both having side aisles on which the chapels open. Between the chapels three large galleries are arranged on the principal axes of the building. The belfry is situated at the end of the church, above the Chapel of the Virgin, and is entered from the principal axis.

The dome, which is the only part of the building really complete, is circular and rests on four piers 14 metres 50c. high, spaced at 16 metres and tied at the upper portions by great arches of 8 metres radius, the whole forming a regular square. Above the four pendentives is the drum of the dome, or tholobate, consisting of two parts or stages. The triforium is 5 metres 40c. high and is

formed of twenty bays opening on to the interior by wide arcades. This is surmounted by a second gallery 7 metres 30c. high, lighted by twenty spacious windows pierced through the exterior wall. Lastly, comes the conical vault (or ovoid rather), the crown being 54 metres above the floor of the church. Outside, at the springing, there is a colonnade 3 metres 50c. high, while above is a lantern 17 metres high, the top of which is 83 metres from the ground, or 124 metres from the bottom of the foundations. The construction of the dome offered a problem rarely set for solution. The majority of cupolas are constructed with light materials bound by strong iron bands so as to neutralise the oblique thrust. At Montmartre, on the contrary, every part is constructed of stones carefully dressed and fitted together. This method is much more scientific than the other, though it has the disadvantage of not resisting the oblique thrust, which has to be neutralised by a careful distribution of the weights and thrusts. Besides, as the tholobate consists of twenty bays supported by relatively slender columns, it has been necessary to determine exactly the direction of the line of pressure in order to assure the stability of the building, the architect having calculated the weight of all the stones in the dome, their form often being dictated by the precise requirements. As a matter of fact, the four piers of the dome support a weight of

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, April 2nd, 1902.



THE SCHOOL PAVILION, GIGGLESWICK.



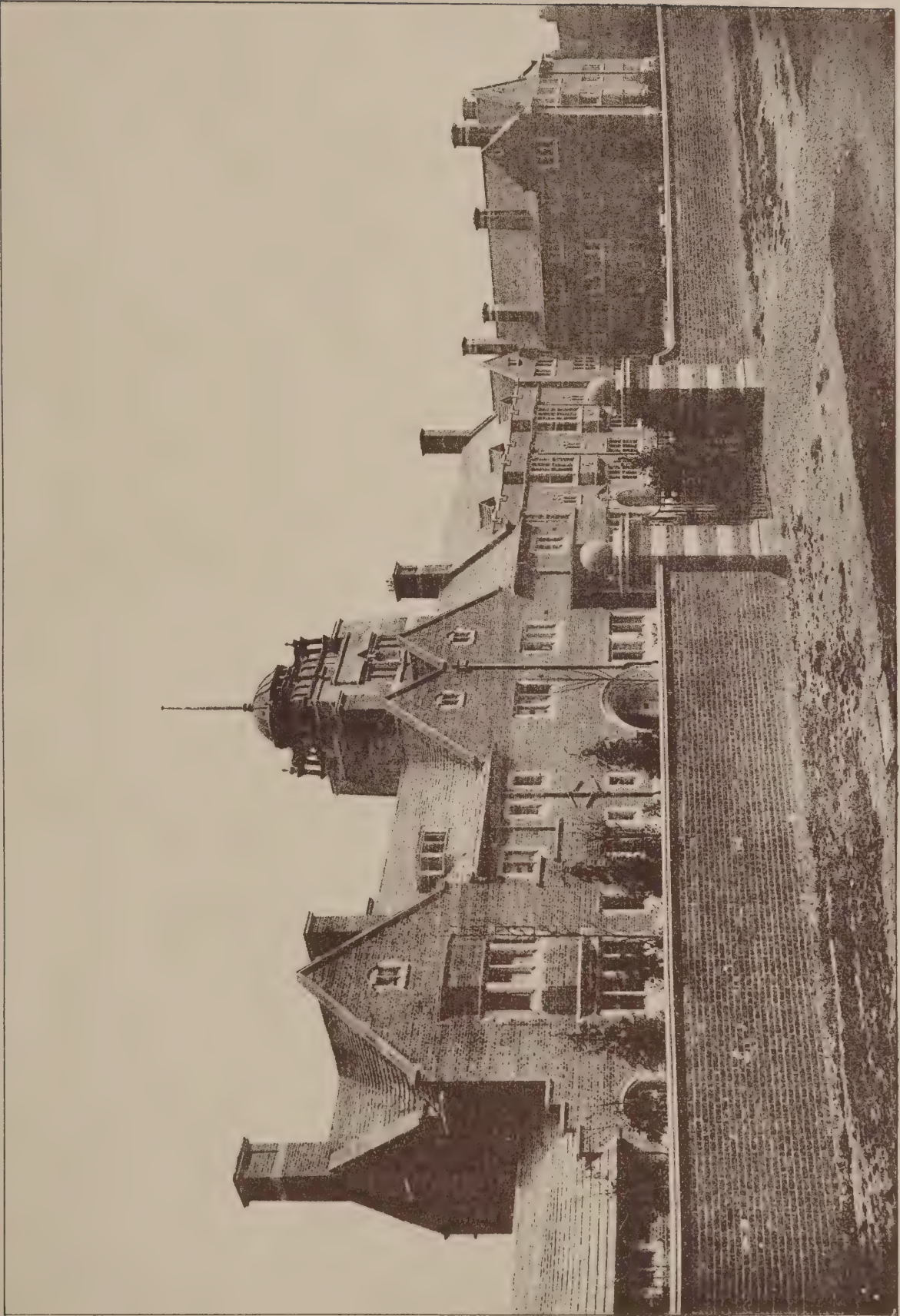
THE GATEHOUSE, GIGGLESWICK.
T. G. JACKSON, R.A., Architect.

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"INK-PHOTO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

WESTMINSTER (PRESBYTERIAN) COLLEGE, CAMBRIDGE.
HENRY T. HARE, F.R.I.B.A., Architect.



"INK-PHOTO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

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GIGGLESWICK SCHOOL CHAPEL: WEST WALL OF NAVE, SHOWING STATUES BY G. J. FRAMPTON, A.R.A.
T. G. JACKSON, R.A., Architect.

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36 kilogrammes 210h. per square centimetre at the floor-level of the church proper. At first sight this may seem enormous, but when it is considered that the stone in the piers would only crush at a pressure of 850 to 1,300 kilogrammes, there is no fear when the pressure does not amount to more than 83 kilogrammes. The stone used is that of Souppes, a small district in the Department of the Seine and Marne. It is transported to Paris by boat. The founda-

tions were begun in the autumn of 1875 according to the plans of the late M. Abadie, who directed the work up to the time of his death in August, 1884, at which time the walls had not reached more than a dozen metres above the floor of the basilica. An interval of some months elapsed and the works were then placed under the control of M. Laissée, Professor of Architecture at the Ecole des Beaux-Arts, and of M. Henri Rauline, a pupil of the late M. Abadie

and his colleague from the first at Montmartre. M. Laissée died in January, 1891, and the work then rested solely with M. Rauline. At the present time the building is far from finished: among the chief work still to be done is the belfry, which, according to the new designs, will be 120 metres high. The interior decoration and finishings have scarcely been begun as yet. Much time and much money are still needed before this great cathedral will be complete.



CHURCH OF THE SACRED HEART, MONTMARTRE, PARIS.

ACETYLENE GAS GENERATORS.

THE following are some additional particulars of the report on acetylene gas generators recently issued by the Home Office, and referred to on p. 79 of our issue for March 19th:—

The forty-six different generators tested can be divided into three classes:—(a) Non-automatic, (b) automatic carbide to water generators, and (c) automatic water to carbide generators. In the first class ten generators were submitted, eight of which, however, failed to come within the standard of efficiency considered safe by the Committee, namely, 90 per cent. of the possible yield of carbide. The remaining two, which came well above the limit, were

"The Ideal" (99.80 efficiency).

"Willey's No. 2" (96.15 efficiency).

With this type of generator a storage holder is necessary of sufficient capacity to take up the total yield of gas from the carbide, and in this respect it differs from those of the automatic class, which are intended to generate the gas as required for consumption.

English inventors appear to have found the automatic carbide to water problem a difficult one to cope with, though the system is largely adopted on the Continent and in America, as only six generators of this class were submitted, and four failed to reach the standard of efficiency laid down by the Committee. The machines which passed satisfactorily were

Strode's "Perfect" (94.72 efficiency).

"Hesperus," portable (94.28 efficiency).

The great advantage of the carbide to water generator, properly constructed, is the purity of the gas generated and the absence of after-generation, which, next to absolute safety, are the chief essentials of good acetylene gas generators.

Twenty-nine firms were represented in the water to carbide class, sixteen with generators having an efficiency of 90 per cent. and more, and thirteen whose generators did not reach this. The following were the sixteen:—

	Efficiency per cent.
1. "Sunbeam" -	99.39
2. "Economic" -	98.8
3. "Gregory Smith No. 1" -	98.8
4. "Allen" -	97.59
5. "Moss's" -	97.54
6. Strode's "Portable" -	97.52
7. "Sir Charles Forbes" -	97.05
8. S. C. "Sovereign" -	96.85
9. "Auto-Simplex" -	96.74
10. "Imperial" (1 lt.) -	96.00
11. "Owens" -	95.04
12. "Howe & Colonial, No. 2" -	94.31
13. Rosco "Automatic" -	91.46
14. Salisbury "Bleriot" (motor lamp) -	90.47
15. "Leading Light" -	90.20
16. Read Halliday -	90.00

The efficiency in some instances was under 70 per cent., and it is difficult to account for a loss of over 30 per cent. of the total yield of gas. It would have been interesting to know something of the conditions under which the machines were tested; for instance, the amount of carbide with which each machine was tested, the number of hours each machine was run, the purity of gas generated, and whether any generators were tested with purifiers attached.

The low efficiency in a good many instances may have been caused by a purifier which not only took the impurities out of the acetylene but evidently took out part of the gas itself. Water absorbs acetylene gas, 1 cub. ft. of water taking up 1 cub. ft. of gas, and consequently machines having a great bulk of water would show a low efficiency until the water became saturated with gas, when the absorption would cease, except when the pressure in the apparatus was high, when there would always be a certain diffusion of gas from the water into the air.

The Committee give in an appendix the various conditions which a generator should fulfil to be considered safe, which may be summed up as follows:—

1. Low temperature.
2. Efficiency 90 per cent.
3. Gas pipes to be of full size.
4. Complete decomposition of carbide in the generator.
5. Low pressure.
6. Absence of impurities.
7. Precautions taken against freezing.
8. Lime sludge not to have access to gas or water pipes.
9. Glass gauges to be avoided.
10. Air-space as small as possible.
11. Copper parts to be avoided.

A great deal of harm has been done to the acetylene industry by the cheap and imperfect machines put on the market in the early days, and also by

the unskilled manner in which installations have been fitted up; but with a good generator, properly fitted pipes and properly constructed gas fittings the installation can be made a perfect success. As compared with other lights, with calcium carbide at £20 per ton the cost is no more than coal gas at 4s. per 1,000 cub. ft. Calcium carbide can be produced on the Continent and in America at about £12 per ton, and there is every prospect of the production in England being cheapened, in fact a considerable reduction in the price has just been made.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Adjoining Plots: Footings, Rights of Light.

BUILDERS' JOURNAL writes: "A bought a plot of land from B, who has other land adjoining the plot. When A staked out an external wall he gave notice to B, who objected to the footings projecting on to his (B's) land: B also objected to windows being put in this external wall; there is no mention of these points in the agreement; and on the plan of the land there is marked 'proposed road' along this boundary. (1) Are footings as proposed by A legally in order, and, if notice has to be given to B, how long will it be before A can proceed to build? (2) Is A entitled to build windows in the external wall (they would be glazed with opaque glass)? (3) If the 'proposed road' were formed as shown, would this have made any difference to the right of light?"

(1) Within the Metropolitan area A may legally construct the projecting footings of an external wall upon his neighbour's property, if necessary, but no similar legal right exists in other parts of the country unless specially obtained. The London Building Act of 1894 (57 and 58 Vict., c. 213) states in section 87, clause 6, that where a building owner proceeds "to build an external wall on his own land, he shall have a right, at his own expense, at any time after the expiration of one month from the service of the notice, to place on the land of the adjoining owner, below the level of the lowest floor, the projecting footings of the external wall, with concrete or other solid sub-structure thereunder, making compensation to the adjoining owner or occupier for any damage occasioned thereby." This Act, however, only applies to the Metropolis. The Model By-laws issued by the Local Government Board in accordance with the provisions of the Public Health Act of 1875 (38 and 39 Vict., c. 55) may be taken as representative of the local by-laws ordinarily enforced in connection with the construction of new streets and buildings. Clause 15 of these Model By-laws states that "every person who shall erect a new building shall construct every wall of such building so as to rest upon proper footings. He shall cause the projection at the widest part of the footings of every wall, on each side of such wall, to be at least equal to one-half of the thickness of such wall at its base, unless an adjoining wall interferes, in which case the projection may be omitted where that wall adjoins." Under these circumstances no powers are given to the building owner to construct the footings for his wall upon the property of the adjoining owner. (2) In the case of an external wall built by A wholly upon his own land, he may construct windows therein if he so desires, but at the same time B has power to prevent A obtaining any prescriptive right of light over his property by erecting a hoarding or building a wall upon his own boundary line. (3) The words "proposed road" on the plan apparently have no practical value, as it would appear to be optional with B whether the proposed road is constructed or not. The property should have been purchased upon the expressed and written condition that B should construct the road within a certain period, and thus provide A with a proper frontage towards

it. If there is any doubt as to the actual conditions under which the property was purchased, A should place the matter in the hands of an experienced solicitor. T. E. C.

Right of Way.

REASON writes: "A owns an estate of about ten acres, which he has laid out for building purposes; it was formerly a farm with house and outbuildings, the only road being an old one running through B's (the adjoining owner's) land. B made and drained his old road, and the land on one side has been built upon; but B will not allow a right of way over this road, contending that A's right is only an agricultural one to the farm; and accordingly B locks the gate in his boundary wall. Is he right in doing so?"

If A, as owner of the adjoining house and land, possessed a right of way over the road C, then it is considered that B cannot confine such right of way within the limits mentioned, unless it has been previously specifically laid down in those terms by means of a formal agreement. Under ordinary circumstances it is customary for all rights to go with the land, and assuming that A, being the original owner of the adjacent property, had acquired a prescriptive right of way over the road C, then the purchasers of the land from A have also acquired the same rights. T. E. C.

Buildings in and around Hamburg.

SUNDERLAND.—T. K. writes: "I intend spending two or three days in Hamburg. Which buildings there are worth visiting?"

Hamburg is a large modern continental city, its two principal buildings, the Börse and the Rath-haus, being both of recent erection, and the latter of first-rate importance. The Nicolai Church in the Hopfen Market has the third highest Gothic tower in Europe (473ft.), and the Michaelis Church also has a high tower (426ft.). An architectural student, however, would probably be disappointed with Hamburg, and would do much better to go on to Lübeck, which is only about an hour's run distant, trains leaving Hamburg at 7.15, 8.45 and 10.30 a.m., and returning from Lübeck at 6.47, 7.55 and 9.0 p.m. In this city there is much old work of great beauty, including the cathedral (1170-1341), the famous Hall of the Hausa (now the Rath-haus), the Holsten Gate (Norman), the exquisite mediæval Burg Gate, and the Gothic Marien-Kirche, besides a number of handsome citizens' houses. The best hotel at Hamburg is the "Hamburger Hof" and at Lübeck the "Stadt Hamburg." G. A. T. M.

Duties of Clerk of Works.

SOUTH CROYDON.—H. G. T. writes: "What are the duties of a clerk of works?"

Get "The Conduct of Building Work and the Duties of a Clerk of Works," by J. Leaning, from Mr. B. T. Batsford, 94, High Holborn, W.C., price 2s. 6d.

Surveying.

WIGHT STUDENT writes: "Are there any recent manuals published giving the best methods of surveying houses and grounds with a view to making a plan?"

Consult Baker's "Surveying" (to be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C., price 2s.), and see an answer to an enquiry on measuring buildings on p. 189 of our issue for April 10th, 1901.

Stresses in Roof-Truss.

LONDON, W.C.—STUDENT writes: "Please give stress diagrams of roof-truss shown on the accompanying tracing (not reproduced). Do you think it is of sufficient strength at point A, or does it require to be made wider?"

It is impossible to give a stress diagram for this roof-truss without knowing more about it. There is no apparent reason for the very peculiar shape, and it is much too weak through the part marked A on the long side, which appears to be practically the middle of the span. If it were increased to 18in. deep through A it would then require about 6 sq. in. in each flange. The principal rafter is not only too light but has several purlins with no struts under them.

HENRY ADAMS.

WEATHER-TIGHT WINDOWS.*

By B. M. WARD.

WHICH are the best methods of preventing windows leaking (water and air) under strong and prolonged pressure of wind and rain?

That is the subject of my paper, which is not meant to instruct you, but to draw out the ideas and opinions of those present. I want to know what is to be done to keep a window weather-tight under the most extraordinary conditions.

In the first place let us consider the junction of the frame and the brick- or stonework at the jambs, head and sills. Bed the frame in hair-mortar, you say. Is this sufficient, especially if the bedding is not very well built? It is very difficult to bed a frame really well. Moreover, under the varying temperatures, this bedding draws away either from the frame or from the brickwork (or stonework); little cracks occur; then in a big storm the wind, if prolonged, will force water through, and the trouble has begun.

Put a weather-bar between the sills (see *eee*, sheets A, B, C)? Good; but what about the jambs, to say nothing of the head? Here crops up the question as to whether the window-frame should be fixed in front of, or behind, a reveal. In this there is plenty of food for discussion. I leave the meal to you.

I have not seen the idea exploited, but it seems to me that a metal tongue for stone, or a cement roll for brick, terra-cotta or concrete, would be a good thing (*d, d, d* in sheets A, B and C). In my opinion the weather side of the metal bar or cement roll would be better exposed to the weather and air (A and B; *d*), and I think the same would apply to the sill weather-bar (B and C); even if the bar or roll were omitted, the mere grooves would be helpful as "air-hollows." This arrangement of the bar or roll would be of very little value if the frame were in front of a reveal. I have also shown a further groove in the solid frames (*fff*, A, B and C), and this serves a double (or triple) purpose. It forms an emergency air-cushion, preventing the further ingress of forced air; it exposes more of the frame itself to the air and so lessens the chance of rotting; and thirdly, by its use less of the girth of the frame comes in contact with the bedding, itself an inducement to rotting; moreover, in this connection the smaller the amount of contact between frame and bedding the better the chance of the bedding being made even and homogeneous.

I have also shown (*ggg*, A, B and C) "the break-water feature" of Mr. Campbell Douglas, advocated in an article of his in "Specification." I have slightly modified it. Mr. Douglas maintains that the fury of the storm will expend itself on this fillet, and only a weak edition will be left to tackle the joint between frame and brickwork. Moreover, I have shown in most cases the frame-sill throated and projecting over the stone sill, the weathering of which is taken back behind that throat (*l, l, l*, A, B and C), another suggestion by Mr. Douglas.

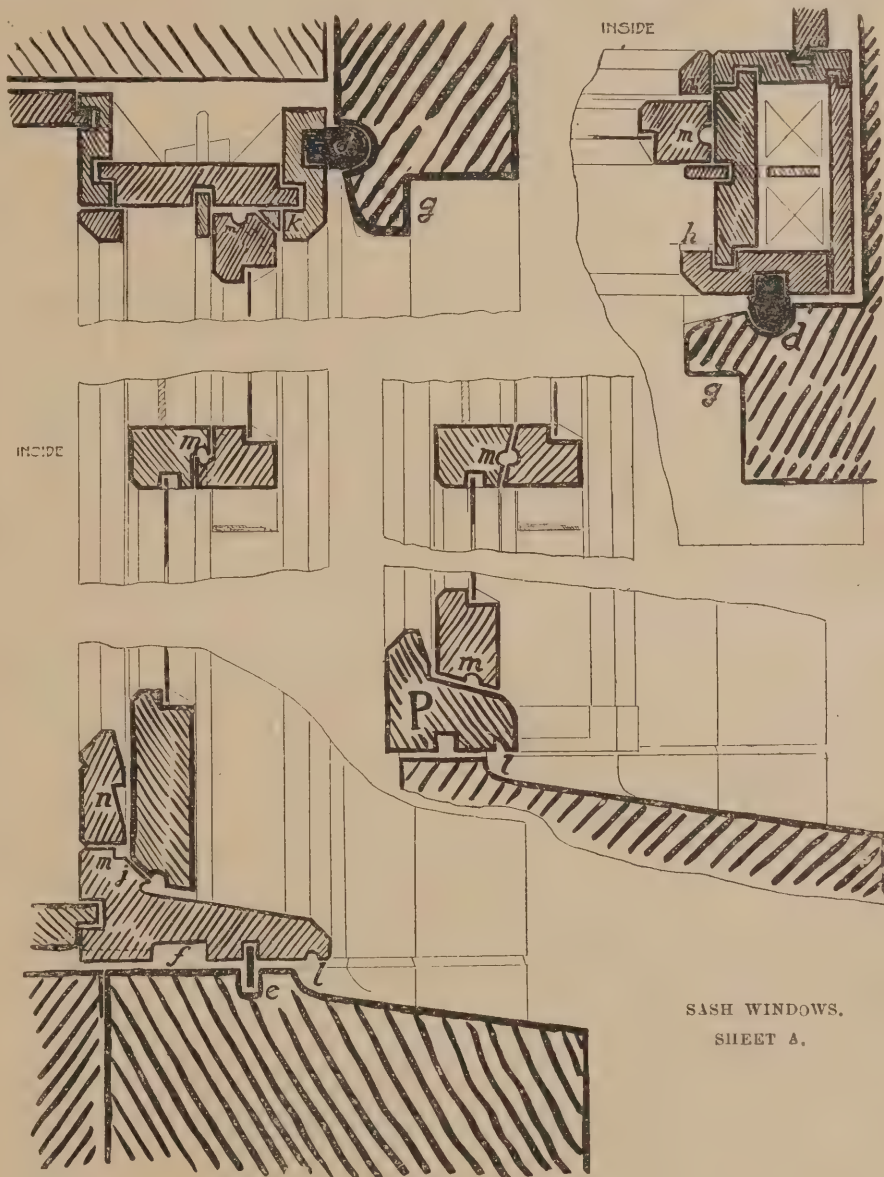
To come, now, to the different types of windows. First, sash windows. These, as generally constructed, keep out the water fairly well, but for incessant rattling in a wind, just when you want to go to sleep, nothing can compete with a sash window. The sashes have shrunk in thickness, and there is now unnecessary space for them between parting slip and lining or bead. Slips of oak or felt or leather (*h, h*, sheet A) fixed to an existing window might stop the rattle. If they did, they would prevent the sashes being opened, so you might as well screw the sashes up altogether. However carefully the sashes are made, however well seasoned the wood may be of which they are made, either they will rattle or they will not slide (at least after rain). The great thing is to press both sashes tight against the parting slip. It struck me the other day that the slope of the sill would help the lower sash to hug the parting bead if the sash could be constantly pressed down, and the slope made steeper than usual (*j, A*); similarly a fillet (*k, A*) in the head would help the upper sash if constantly pressed up. All we want, now, is a wonderful fastener which will, at one and the

same time, push down the lower sash, push up the upper sash and pull the meeting-rails tight together. Whether these particular sections of bead and sill are valuable or absurd, the type of fastener I have described would be a useful addition to any existing window.

But all this means a window shut tight—an abomination, at least in a bedroom. However, fairly large slots in the meeting-rails, which could be closed with little shutters, might be adopted. I have shown a great number of "water hollows" (as they are called; "air hollows" would be a better word—*m, m, m*; A, B and C). These help considerably in keeping out draught and the weather generally. Any wet that gets to them is carried down at once in the case of jambs, gets down as soon as it can in the case of sills, while in the heads it slips out of the holes drilled for that purpose.

boxes. All this is very true, I think; but Mr. Douglas does not say how he stops the feet of the jamb-boxes, to prevent them rotting in their most susceptible part. I have shown a block under the feet, though I do not think it would answer very well; so I rather suggest the other sill, which provides little more contact with the bedding. This would be better, to my mind, if the weather bar were exposed (as in B and C). The tall fascia in front of the bottom rail allows, of course, the bottom sash to be raised for ventilation through the meeting rails, without causing draught below. The shape of the fascia provides an emergency air-cushion at *n*, and lessens the risk of the fascia and bottom rail sticking together.

So much for sash windows. Of casement windows with the lights hung at the side and opening out, there have been suggested so many

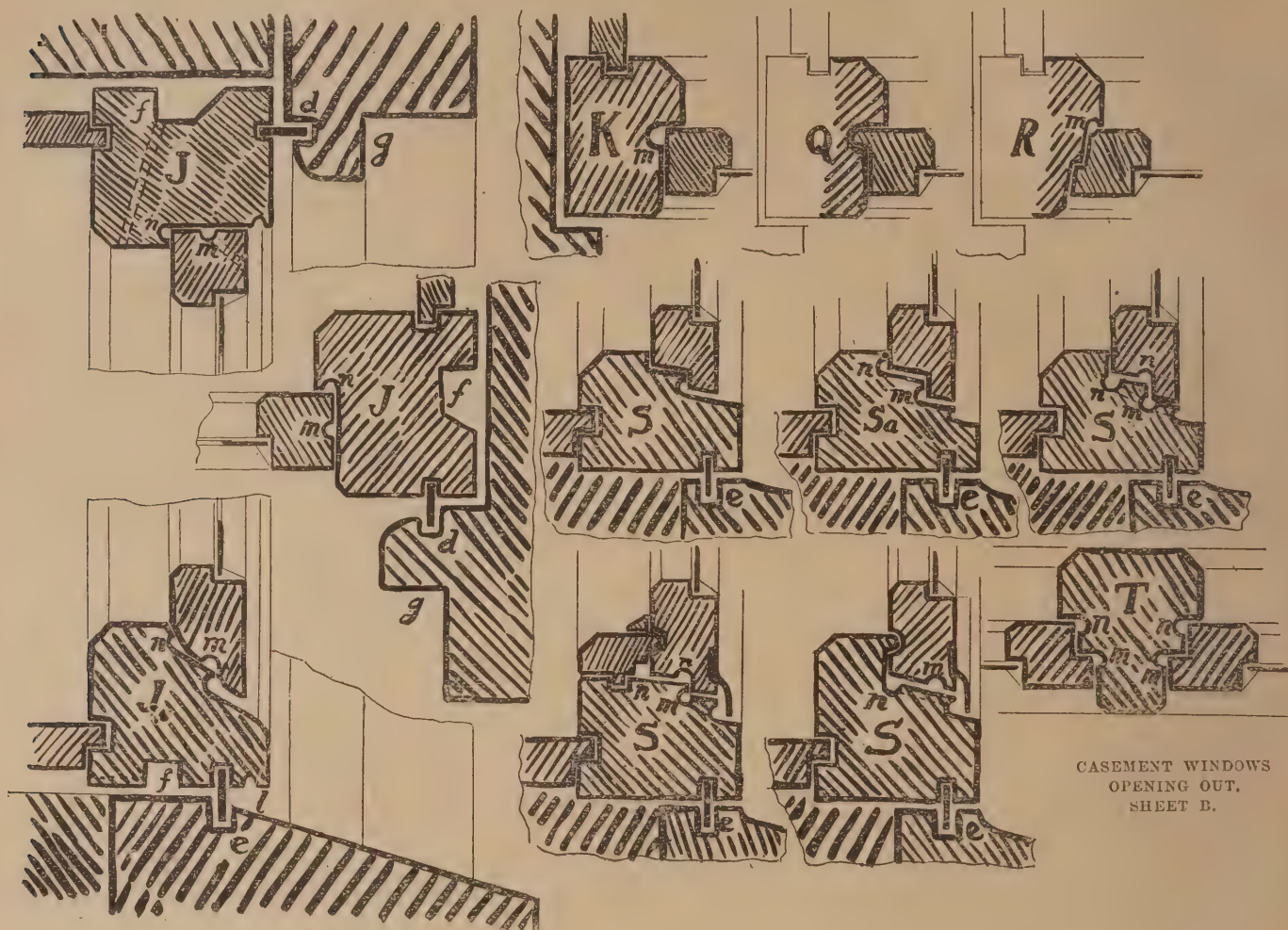


The greater object, however, of these hollows is the air-cushion which they form. This prevents forced air from making any progress. Those air hollows marked *n, n, n* on sheets A, B and C are emergency hollows, so that in case of bad fitting the winds that escape through "*m*" may be stopped by "*n*."

I have shown two different sections of sill in sheet A. That marked *P* is Mr. Campbell Douglas's section. He says that the wide sill, usually prescribed, is very liable to rot; will only allow a very gradual slope unless it is considerably deepened; that the wet remains on this gradual slope in a wind, and blows up under the sash; that the wide bedded portion all unventilated is conducive to rot; that the weathering of the stone sill under and behind a throat in the frame sill is a great improvement, and so on. He says, too, that he finds there is no need to stay the outer parts of the feet of the jamb-

sections of bottom rail and sill, and so many plans of jambs, most of which have their good points, that it is difficult to know which is the best. That marked *J, J, J* on sheet B seems to me to be good enough. There is little doubt that rebated rails in a casement would be a great advantage if they could only be made quite certain of fitting well to the frame and yet without danger of sticking. In this case (*J J J*) there is always an emergency airhollow, *n, n, n*; *K* is a usual section; *Q* can only be applied to the hinged side, of course; *K* would do for the other; *R* would be good if the fitting could be guaranteed—the splays lessen the chance of sticking; *K, Q* and *R* are all copied, and so are the sills marked *S*, of which *Sa* seems about the best. The mullion *T* is also copied, and looks satisfactory, though I personally should always feel afraid of the rebates. All these details (sheet B) would equally apply to a fanlight

* A paper read before the Liverpool Architectural Society on March 3rd, 1902.



CASEMENT WINDOWS
OPENING OUT.
SHEET B.

hung at the top, except that Q could only be the head.

Wood casements hung at the side and opening in are more difficult to make weather-tight. It seems necessary to call in the use of metal in some shape or form in order to make a really satisfactory arrangement. Here I may mention that before writing this paper I thought it would be a good thing to get the opinions of some of the local joiners and contractors on the whole subject of weather-tight windows. I therefore wrote to five or six prominent firms, but only received replies from two. One said they could give me no information; the other, Messrs. William Tomkinson & Sons, were good enough to send me a pamphlet on Elliott's fitting to wood casements opening in, saying that they had always found them satisfactory.

In the section of sill marked J (sheet c) I have shown Elliott's metal channels, for I cannot think of anything better. It would be unpleasant for anyone to lean the elbow on them if thinly clothed, but otherwise they would be very satisfactory. Between the jambs marked J I have shown a plan of hooked meeting-rails; the right-hand jamb has obviously no connection with these meeting-rails.

K, K are plans of jambs for one window with metal bars. These would be very satisfactory if well fitted. Q, Q are sections of sills often used, and here copied.

For fanlights hung at the bottom, the left-hand jamb (the hinged side) of J and K would not apply, but the other jambs and heads would; and for the bottom rail that on the transom R would, I think, do well enough.

Fanlights hung at the centre (horizontal centre) can, I suppose, never be made quite weather-tight, especially at the centre; S and T show ordinary methods. It is better, if you must have a fanlight hung at the centre, to have it of iron, as there is then less unrebated portion at the centre.

In the plans of jambs, S and T, I have shown the beads *n, n* solid on the jambs: a joiner would

much prefer these to be planted, but I think it is worth the extra expense to have them solid.

With regard to casements revolving at their vertical centre, Captain Chaddock has very kindly brought his model here. There ought to be the making of a really weather-tight window in this invention, though it is really intended for a bulkhead door in a ship. The window need not revolve on its exact centre at all; it can have the greater part to go out, or to come in, and also can be swung back into the room, the reverse side in, so as to be cleaned with safety.

With regard to iron casements, I only want to ask how long they will keep weather-tight. The manufacturers invite you to play a fire-hose on one of their windows and guarantee there shall not be a drop of moisture inside as a consequence. But this is with a newly-fitted window. I want to know how weather-tight they are after they have been slammed many hundreds of times and after they have been subjected to the extremes of temperature for, say, twenty years.

I have touched on most of the varieties of windows usually specified, and I am not going to speak of any other kinds.

The general arguments against nearly every section and plan I have advocated are complicatedness and expensiveness. With regard to the former, the golden rule that the simplest is the best seems not to apply here at all. Simple splays and simple joints will not do the work required when under the severest conditions. With regard to expensiveness, I have purposely had no regard for expense. We want to know what is the best; we already know what is the cheapest. Still it does seem absurd that we should have to be always hacking out little air-hollows here, there and everywhere, and inserting little metal tongues and channels, and always we are fearful that the joiner will not make a perfect fit, or if the fit is perfect at first we know that the wood will shrink if it has not been well seasoned, or worse still, we know that if it has been well seasoned it will swell in wet weather.

Yet another point. I have so far spoken of

"weather" either as wet or as draught. There is a third feature of weather—temperature. A window ought to keep out the cold and keep in the heat. Make your window never so water-tight, never so air-tight, one thickness of glass will not keep in the heat or keep out the cold; not even plate glass $\frac{1}{4}$ in. thick.

While preparing this paper I have come more and more to the conclusion I arrived at years ago, that this country of ours, with its "climate of samples," requires the almost universal adoption of *double windows*: double casements or sashes, with single or double frames. In Canada, I believe, they go further; they screw up their double windows inside and out during the winter, and provide for the ventilation (or perhaps they don't) by other means.

With double windows *simple* details will be quite good enough; the space between the sheets of glass is a splendid air-cushion, stopping wind coming through, and as for the heat and cold I suppose there is not a better non-conductor of heat than a mere layer of air. I am told that two sheets of glass with the air between them are as efficient as a 9 in. brick wall, and that a single pane of glass has rarely 25 per cent. of that efficiency. As regards light, two clean panes of glass stop less light than one dirty pane; though that is not meant for an argument. I ask you, finally, are not double windows the best of all; and if not, why not?

"The Villages of Port Sunlight and Thornton Hough."—Mr. W. H. Lever read his paper before the Liverpool Architectural Society last week.

Home Arts and Industries Association.—The eighteenth annual exhibition of work done in the classes of the Home Arts and Industries Association will be held from May 29th to June 2nd in the Gallery of the Royal Albert Hall. The exhibition will include specimens of homespun and linens, modelling in terra-cotta, metal repoussé, woodcarving, inlay, stencils, lace, knitting baskets, rugs and toys, and of other arts and industries.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"Do you seriously mean," broke in Allen, a little impatiently, "that it is a thing to wish for and to look forward to, that we should abandon all attempts at original architecture, and content ourselves with simply sponging on the past?"

"I do," replied Mr. Rose suavely; "and for this reason, if for no other, that the world can now successfully do nothing else. Nor, indeed, is it to be expected, or even wished, that it should."—W. H. MALLOCK, in "The New Republic."

Our Plates.

WESTMINSTER COLLEGE, CAMBRIDGE, is a new college

which has recently been erected for the Presbyterians. The College proper is T-shaped on plan and contains four classrooms, a common-room, and eight bedrooms and eight sitting-rooms on the ground floor, with lavatories, &c. Above are other bedrooms and sitting-rooms. At the lower end of the T are arranged the dining-hall and library and the principal's residence, the latter fronting on the road. At the rear leading from the dining-hall are the kitchen, scullery, servants' hall, &c. Mr. Henry T. Hare, F.R.I.B.A., is the architect.—We illustrated the exterior of Giggleswick School Chapel, Settle, and the construction of its dome, in our issue of September 11th last; particulars of the building were published on p. 74 of that issue, and on p. 546 of our issue for August 14th, 1901.

The New R.A.

On Wednesday last Mr. G. J. Frampton, Associate, was elected an Academician in the place of the late Mr. T. Sidney Cooper. In the final ballot Mr. Frampton received twenty-six votes to twenty given to Mr. Waterlow, the landscape painter. Mr. Frampton, who lost the January election to Mr. Bodley by one vote, received his early training at Lambeth, and subsequently became a student of the Royal Academy, where he

carried off the gold medal and travelling studentship in 1887 with a modelled group illustrating "An Act of Mercy." Later he continued his studies in Paris under MM. Mercie and Dagnan Bouveret, and in the studio of Sir Edgar Boehm. No material seems to come amiss to him, whether marble, ivory, silver, or gold: he has carried out work on the largest and boldest scale, and yet he can adapt himself on occasion to the craft of the jeweller. He is one of the most distinguished of the group of artists to whose efforts we owe the renaissance of sculpture in England, and no one who has studied Mr. Frampton's work during the closing decade of the last century was surprised that at the Paris Exhibition of 1900 he was awarded a grand prix, the greatest honour that can be bestowed on an artist in Paris. He has done much architectural sculpture of very high rank, and is a co-director with Mr. Lethaby of the L.C.C. Arts and Crafts School, in Regent Street, W. Mr. Frampton was elected an A.R.A. in 1894, and lately he has been chosen as the Master of the Art Workers' Guild. He married an artist, and his wife, Miss Christabel Cockerell, is a frequent exhibitor of portraits and subject pictures at the Academy and the New Gallery.

Mr. Belcher and the New Government Offices.

MR. JOHN BELCHER, A.R.A., observes in a letter to the "Times" that many persons are anxiously awaiting the report of the advisory committee appointed to consider the completion of the new Government buildings designed by the late J. M. Brydon. Mr. Brydon told Mr. Belcher that there were many things he intended to revise when working out the details. "One alteration which I learn is proposed would not have met with his approval, the substitution of a flat for the low roof provided in his design; for the effect of the balustrading against the open sky produces an entirely different one from that against a dark roof. If a flat is required, it should be at a higher level, and it is exactly these subtle points which require consideration. These the advisory committee

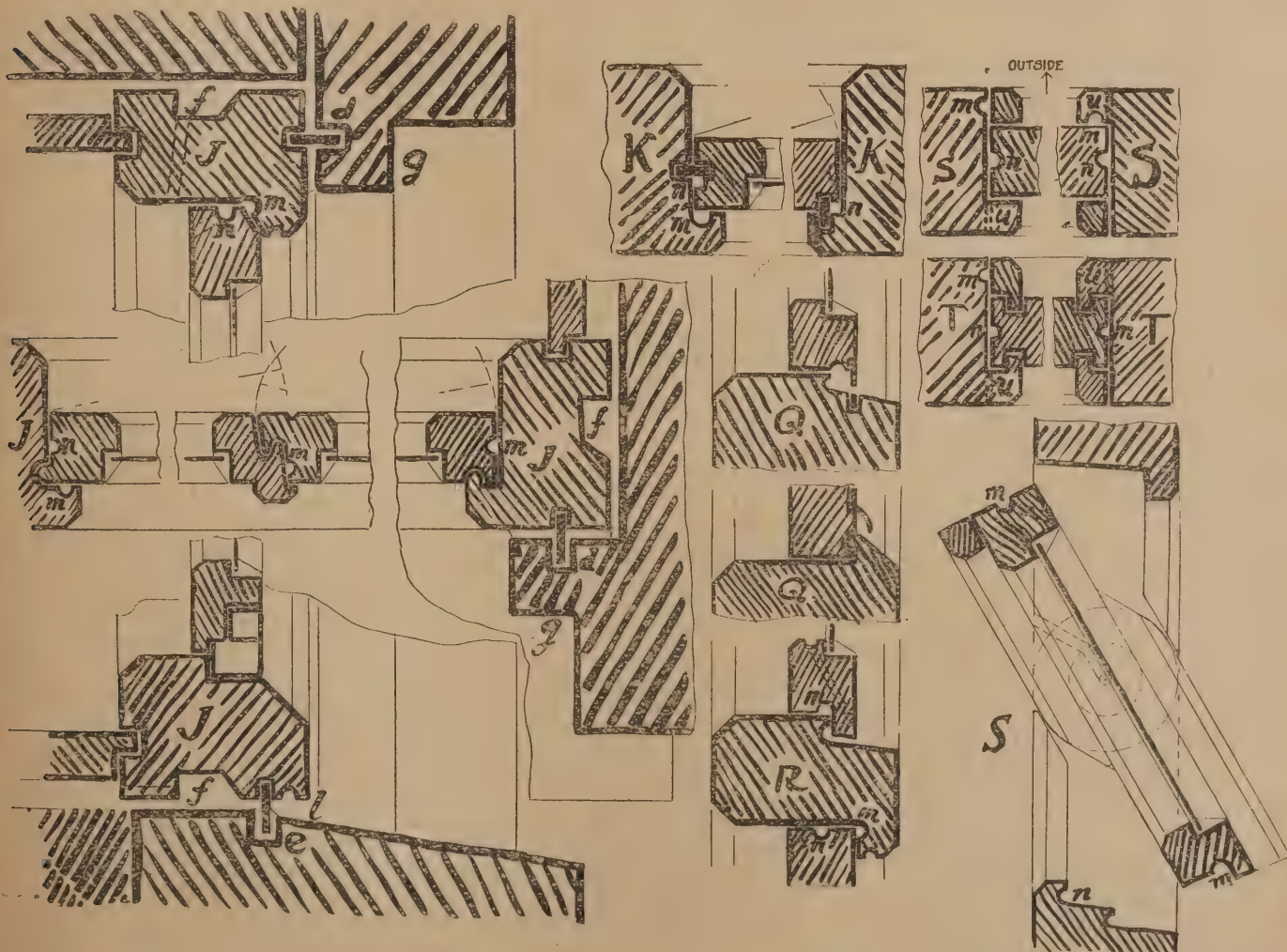
may fairly be asked to grant the public some assurance will be adequately dealt with."

Richmond Hill View.

At a special meeting of the Richmond Town Council a draft agreement provisionally accepted by a committee was submitted asking the council to agree to support the Richmond Hill (Preservation of View) Bill, and enclosure of the Ham lamas lands, in return for some additional concessions of meadow land at the foot of Richmond Hill over and above those originally included in the Bill. The committee have recommended the council to make a further grant of £5,000, making £10,000 in all, towards the purchase of the Marble Hill Estate, for the purpose of protecting the view from Richmond Hill, as, owing to the refusal of the Middlesex County Council, the City Corporation and Hammersmith to support the present scheme, only £54,000 has yet been secured out of the total of £72,000 required. The Twickenham District Council will be asked to double its promised contribution of £3,000 towards the same object.

Some Glasgow Buildings.

A LARGE party of the members of the Edinburgh Architectural Association visited Glasgow recently, and under the auspices and leadership of the Glasgow Architectural Association inspected a number of the more important among recently-erected buildings. The programme was arranged by the president of the Glasgow Association, and among the buildings visited were the Mercantile Chambers, Bothwell Street (Messrs. James Salmon & Son, architects), Waterloo Chambers, Waterloo Street (Messrs. J. Burnet & Son, architects), Savings Bank, Ingram Street (Messrs. J. Burnet & Son, architects), School of Art, Renfrew Street (Messrs. Honeyman & Keppie, architects), Belmont Church (Mr. James Millar, architect) and Stevenson Memorial Church (Mr. John J. Stevenson, London, architect). Several private residences were also visited.



FIREPROOF PARTITIONS.

SOME NEW YORK TESTS.

A VERY interesting series of tests with fire-proof partition materials was recently made under the supervision of the Department of Buildings, New York City. Briefly stated, the purpose of the tests was to record the effect of a fire of one hour's duration, commencing at 500 degs. Fahr. and increasing to 1,700 degs. Fahr., followed immediately by the application of a stream of water from a hose on the exposed side for two and a half minutes; which is a similar method to that adopted by the British Fire Prevention Committee. The areas of the partitions tested were 137.75 sq. ft., with a width of 14 ft. 6 in. and a height of 9 ft. 6 in. The tests were made in a test-house. The following forms of partition were tested:—

Bell Plaster Composition Blocks.—One partition of solid section 2 in. thick and one of hollow section 3 in. thick. The composition of the blocks was plaster-of-Paris and cinders. After the blocks were put in place they were covered with $\frac{1}{2}$ in. coat of "King's Windsor" plaster. Maximum temperature during test, 1,724 degs. Fahr.

Metropolitan Partition.—Solid plaster composition blocks 2 in. thick. The composition of the blocks was plaster-of-Paris, wood chips, cocoa-nut fibre and asbestos. After the blocks were put in place they were covered with $\frac{1}{2}$ in. coat "King's Windsor" browning. Maximum temperature during test, 2,030 degs. Fahr.

Norman Partition.—Solid composition plaster blocks 2 in. thick. The composition of the blocks was plaster-of-Paris and wood fibre. The blocks were fastened together with rods and turnbuckles. After the blocks were put in place they were covered with a $\frac{1}{2}$ in. coat of "King's Windsor" browning. Maximum temperature during test, 1,706 degs. Fahr.

Sanitary Partition.—Solid composition plaster blocks 2 in. and 3 in. thick, fastened together with metal rods. The composition of the blocks was plaster-of-Paris, ashes and a fluid cement. After the blocks were put in place they were coated partly with common lime mortar and partly with Platt plaster. Maximum temperature during test, 1,832 degs. Fahr.

White Partition.—Solid and cellular composition plaster blocks 3 in. thick. The composition of the blocks was plaster-of-Paris, asbestos and wood fibre. The blocks after being put in place were plastered with "Adamant" browning $\frac{1}{2}$ in. coat. Maximum temperature during test, 1,760 degs. Fahr.

Freeman-Dobbin Partition.—Solid and cellular composition plaster blocks, the solid 2 in. thick and the cellular 3 in. thick. The composition of the blocks was plaster-of-Paris, silicate and carbonate of lime and wood fibre. The blocks after being put in place were plastered with a $\frac{1}{2}$ in. coat gauged mortar. Maximum temperature during test, 1,760 degs. Fahr.

Expanded Metal Lath and Plaster Partition.—Composed of expanded metal on 1 in. by $\frac{3}{16}$ in. metal studs at 12 in. centres covered with scratch and browning coats of "King's Windsor," making a total thickness of 2 $\frac{1}{2}$ in. Maximum temperature during test, 1,706 degs. Fahr.

Moeslein Partition.—Metal lath and plaster partition, composed of perforated sheet metal attached to both sides of T-iron studs 1 in. by $\frac{1}{2}$ in. at 11 in. centres, forming an air-space of 1 $\frac{1}{2}$ in. between the metal sheets, covered with "King's Windsor" scratch coat, making a total thickness of 3 in. Maximum temperature during test, 2,021 degs. Fahr.

Roebbling Partition.—Wire mesh and plaster. Composed of two sheets of No. 22 wire $\frac{3}{16}$ in. mesh, stiffened by $\frac{1}{2}$ in. steel rods 7 in. apart attached to 2 in. by $\frac{1}{2}$ in. metal studs, forming an air-space 2 in. wide between the metal sheets, covered on the inside with white putty coat of plaster and on the outside with "Rock wall plaster" to a thickness of 3 in. Maximum temperature during test, 1,994 degs. Fahr.

Roebbling Partition.—Wire mesh and plaster. Construction same as above, but of one sheet of wire mesh on $\frac{3}{16}$ in. by $\frac{1}{2}$ in. channel studs at 16 in. centres, covered with "Acme" patent plaster to a thickness of 2 $\frac{1}{2}$ in. Maximum temperature during test, 1,800 degs. Fahr.

Averill Partition.—Metal lath and plaster. Composed of $\frac{3}{16}$ in. by 1 in. flat uprights at 12 in. centres, fastened top and bottom to $\frac{3}{16}$ in. by 1 in. plates with Schratwieser metal lath on one side. The metal lath was plastered on one side, and the other side was filled in with sawdust and hydraulic cement composition flush with the metal studs. This was then plastered with a scratch and browning coat of sand and hydraulic cement, making a total thickness of 2 $\frac{1}{2}$ in.

Averill Partition.—Sawdust and hydraulic cement composition blocks 2 in. thick, plastered with scratch and browning coat of cement mortar to a thickness of 3 in. Maximum temperature during test, 2,102 degs. Fahr.

Schratwieser Partition.—Metal lath and plaster. Solid and hollow partition similar to other metal lath partitions, plastered with "King's Windsor" asbestos cement to 2 in. and 3 in. respectively. Maximum temperature of test not taken because of accident to pyrometer.

Tile Block Partition.—Henry Maurer & Son. Porous terra-cotta cellular blocks, composed of 12 in. by 9 in. by 2 in. hollow blocks with three air-cells each, the walls of the blocks being about $\frac{1}{16}$ in. thick. In the horizontal joints a metal strap $\frac{1}{2}$ in. wide of No. 24 United States gauge was laid. In another wall 8 in. by 12 in. by 3 in. semi-porous cellular blocks with two air-cells were used without the metal strap. Both partitions were plastered with $\frac{1}{2}$ in. "King's Windsor." Maximum temperature during test, 2,057 degs. Fahr.

Brinkman Partition.—S. G. Brinkman's solid terra-cotta blocks, composed of 15 $\frac{1}{2}$ in. by 9 $\frac{1}{2}$ in. by 2 in. blocks and 16 $\frac{1}{2}$ in. by 10 in. by 1 $\frac{1}{2}$ in. blocks, with a stamped metal I-bar laid in the horizontal joints supported by metal uprights. Each partition was covered with $\frac{1}{2}$ in. of plaster on each side. Maximum temperature during test, 1,706 degs. Fahr.

Concrete Block Partitions.—Sprickerhoff partitions. The composition of the blocks was 1 part Portland cement, 1 part of sand and 5 parts steam ashes, covered with $\frac{1}{2}$ in. coat of "King's Windsor" browning mortar. Maximum temperature during test, 1,863 degs. Fahr.

The result of the tests can be briefly summarized:—

Composition Plaster Blocks.—All the composition plaster block partitions had the plaster coating calcined from their surface, and the body of the blocks was also calcined to a greater or less depth, generally from $\frac{1}{2}$ in. to 1 $\frac{1}{2}$ in., and this portion was washed away by the water. In no case did the fire or water pass through the partitions. It is interesting to note here that had the test been continued for a longer time the whole thickness of this composition plaster would have been calcined and therefore rendered incohesive and soluble.

Metal Lath and Plaster Partitions and Metal Lath and Cement Composition (Averill).—All the metal lath partitions had the plaster or cement composition calcined to a greater or less depth, part of which was washed away by the water, exposing in some places the metalwork. In no case did the fire or water pass through the partitions. The same observation holds good here as in the case of the plaster block composition blocks—that had the fire been continued for a longer time the whole thickness of the plaster would have been calcined and therefore rendered incohesive and soluble, and after this the metal work would have been directly exposed to the fire.

Tile Block Partitions.—Porous and semi-porous cellular terra-cotta blocks. The only effect of the fire and water on the terra-cotta cellular blocks was to remove the plaster coating, leaving the stability of the wall intact and actual material of the block uninjured.

Solid Terra-Cotta Blocks with Exposed Stamped Metal I-Beam Fastenings.—One effect of the fire and water had been to remove the plaster. Another effect was, the metal fastenings were slightly deflected in places. The blocks suffered no injury. In no place had fire or water passed through the partition.

With regard to these tests the "Brickbuilder" of Boston, U.S.A., says:—The result makes one thing very plain, which was already well known to those having an elementary knowledge of

chemistry—that plaster-of-Paris, lime plaster, carbonate of lime, or any of its compounds are not fireproof materials; that at best they are merely non-combustible and cannot resist the action of fire and water either separately or alternately. Therefore any partition depending upon these materials for its structure or its filling cannot be depended upon to endure great heat for any considerable length of time; and any partition whose metal structure is dependent upon an insulation of plaster and its compounds must fail by reason of the destruction of the insulating material and the exposure of its structure to the direct action of the heat. Another result which is also evident is that in the event of a fire not sufficient to totally destroy the plaster composition partitions, the repairs required to restore them to an acceptable condition would amount almost to a virtual replacement of many of the blocks of the block partitions and a refilling of the plaster body in the metal-lath partitions, an item which must be considered in deciding on the relative merits of various materials.

In regard to the tests of the porous and semi-porous tile blocks, the solid tile blocks and the concrete blocks, had the test been carried further—to the point of failure of these two different materials—the result could be predicted almost to a certainty. The concrete blocks probably would have been affected first. The component parts of the concrete having different coefficients of expansion would have been under great strain, and upon the application of water, under the sudden cooling would probably have developed cracks which would have impaired its structure. The calcining effects of the great heat would also have affected the cement to some extent (depending upon the temperature), and this would have impaired its binding properties.

The porous and semi-porous cellular fireclay terra-cotta, being a porous homogeneous material, could have endured a continuous heat short of the vitrification point without any structural disintegration, and could then have passed through the water-test without harm, because its porous structure would have allowed contraction of volume without great strain, as the introduction of pores or minute air-cells into its structure permits sudden contraction without appreciable destructive effects.

All these results are what might have been expected. Fireclay needs no recommendation; its qualities are too well-known to require it. The blast furnace, the steel converters, the open-hearth steel furnaces, and the dome and rotary cement kilns, all testify to the uses to which this refractory material can be put. It is not strange, then, that it endures where other materials fail.

In judging these tests, however, one fact must not be overlooked. All these partitions were without openings and rested upon a brick floor, or on steel members which rested on the brick floors. It is hardly necessary to point out that these conditions were highly favourable ones for the test, but one of these conditions, that of no openings, cannot always be realised in practice. The fact that it cannot be realised, however, makes it highly important that the openings be made as few as possible and that all openings be re-enforced with metal frames covered with insulating material. The partition should be made as independent as it is possible to make it of any required additional stability, but as conditions sometimes make this dependence necessary, the metal frames around such openings should be carefully secured to floor and ceiling and thoroughly protected from sudden changes of temperature. The partition should also rest directly upon and be cemented directly to the incombustible floor material, so that the bond of these two can be depended upon. It is no uncommon thing to see partitions set upon a layer of dust, which of course prevents any possible bond between the floor and the partitions and may cause the partition to fall in case of strain. Partitions set upon wood or other inflammable material cannot be considered as any more than temporary non-combustible screens which may fall at a critical moment.

In conclusion it may be said that the porous fireclay material as a fire and water resisting medium has been proven. Now the fulfilment of its highest function depends entirely upon the intelligent use made of it by the architect and manufacturer.

Builders' Notes.

The Reading and District Building Trades Masters' Association held its annual dinner recently. Mr. J. T. Bottrill presided.

National Registration of Plumbers.—At a public meeting of health and water authorities, architects, members of the medical profession, master and operative plumbers, and others, recently held at the Technical College, Bradford, a resolution was carried expressing the hope that the Plumbers Registration Bill may be successfully passed through its several stages in the House of Commons and become law.

Laxton's Builders' Price-Book for 1902, published by Kelly's Directories, Ltd., has just been issued and is thoroughly revised to date. The memoranda and methods of measurements described at the commencement of each Trade division have been extended in many places. The Electric Lighting section has received special care and attention, and the rules for installations issued by the Sun Insurance Office have wisely been included, as well as those of the London County Council with regard to the protection of public buildings from fire. The notes on law cases affecting the by-laws have been brought up to date.

The **Bradford Master-Builders' Association** held its annual meeting recently, Alderman W. Holdsworth, J.P., presiding. Alderman Holdsworth was re-elected president, with Messrs. Phineas Drake, Wallace Daykin and Angus Moulson vice-presidents, and Mr. W. Moulson, J.P., treasurer. Mr. A. Gadie resigned the position of secretary, and Mr. J. H. Dawson was elected in his place. It was reported that a dispute in the trade had arisen at the electricity works, and that both sides were prepared to refer the matter to a board of conciliation, as provided when the recent dispute came to an end. The following gentlemen were appointed to represent the masters on the board of conciliation, which is a permanent body:—Councillors O'Flynn and Gadie, Messrs. Drake, Moulson and Daykin, with Alderman Holdsworth president.

Mr. W. Fassnidge, builder, of Uxbridge, died recently at the age of seventy-six years. He had been associated with the building trade, and especially ecclesiastical building, for upwards of half a century. In fact, it is over fifty years ago since he restored Hillingdon Church, which work he accomplished in 1851, and which was the start of the restoration movement in the district. Since that time Mr. Fassnidge built St. Andrew's, Hillingdon West, in 1864. He also built Iver Heath and Yiewsley churches, restored Uxbridge Parish Church in 1870, restored Denham Church, built Denham rectory and restored Watford Church. He had also undertaken the restoration of other churches in the various villages surrounding Uxbridge, and had done other similar works elsewhere, notably the restoration of Chalvey Church, Slough. One of the most recently completed works of Messrs. Fassnidge & Son was the Jewish Working Boys' Home at Hayes, which was opened not long ago by Lord Rothschild and is the first establishment of the kind in England.

London County Council.—At last week's meeting of the Council the sum of £56,151 was voted for the erection of working-class dwellings on Preston Road and Norfolk Street sites, Poplar. It was decided to acquire at a cost not exceeding £165,000 the freehold and other interest in the properties on the west side of Southampton Row, between Vernon Place and Bloomsbury Place, for the purpose of widening Southampton Row to 80ft. In reply to Mr. Foster, Sir Algernon West said the regulations submitted in regard to electric lighting and heating arrangements at theatres, houses, rooms and other places of public resort would only apply to new buildings. The sum of £20,000 was voted as five-sixths of the nett cost of widening the Strand to 80ft. at Nos. 91, 92, 93, proposed to be undertaken by the council of the City of Westminster. The improvement deals with the block directly east of the Strand frontage of the Hotel Cecil. The consideration of the report of the Building Act Committee dealing with the name of the new street from Holborn to the Strand was adjourned. Lord Welby said he believed the Boadicea statue for Westminster Bridge would be in position by the time of the Coronation.

Keystones.

The Queen Victoria Memorial Fund now amounts to £191,730.

Mr. Alfred Gilbert's House in Maida Vale, specially designed and built for him, is to be sold by auction this month.

A **Stained-Glass Window** has been placed in at St. James's Church, Doncaster. The window has been supplied by Messrs. Heaton, Butler & Baines, of London.

Enclosure of Stonehenge.—A committee sat last week at Salisbury to enquire into the enclosure of Stonehenge and the alleged obstruction of public rights-of-way leading to it. The Committee will in due course report to the Wilts County Council.

Lancing College.—It is proposed to construct the groined ceiling of the sanctuary of Lancing College as a memorial to the Rev. Edmund Field, and the chapel is to be completed. The cathedral-like chapel was designed by the late Mr. Carpenter, who built several fine churches in London.

Memorial Church, Mandalay.—A new church in memory of Queen Victoria, Kaiser-i-Hind, which has been erected outside the fort and in close proximity to the Residency at Mandalay, has been consecrated. It is a cruciform structure of brick, and may be described as Gothic in its architecture.

Notice.—The publisher of THE ARCHITECTURAL REVIEW (Effingham House, Arundel Street, Strand, W.C.) will be glad to send a copy of the March or April issue of that publication in exchange for a copy of the January number. He will also be glad to send a copy of the current issue in exchange for a copy of the BUILDERS' JOURNAL for February 13th, 1901 (which is out of print).

Clare Lunatic Asylum Ireland, which was built thirty-five years ago, is to be enlarged. Applications for the position of architect were invited, and Mr. Francis O'Connor, M.S.A., of Ennis, has been selected to prepare the plans and superintend the erection of the buildings. The new buildings will accommodate 400 chronic patients, who are now housed in the different workhouses throughout the county. The estimated cost of the proposed works is £35,000.

The Municipal Hall, Public Library and Technical Schools at Colne, erected by the Corporation at a cost of £10,000, was opened recently. The buildings have a main frontage to Albert Road. The public hall (which will seat a thousand persons) and library are approached by the elevation to Albert Road, and the technical schools occupy the rear portion of the building, which has a very commanding site and is erected from the designs of Messrs. Woodhouse & Willoughby, architects, of Manchester.

The Series of Mural Paintings covering the arches of six chapels recently brought to light through the energy and artistic zeal of M. Celles, the new curé of the parish of Saint Nicolas des Champs, Paris, continues to attract much attention. Till now these paintings have been hidden by whitewash, and it was left to M. Celles to clean and revive them and to discover their historical interest. They are dated 1623, an epoch which is somewhat neglected in French art history. The best known names of that period were Simon Vouet (born in Paris in 1582, died in 1649) and Quintin Varin, a contemporary. These large paintings, though they recall the Italian school, are vigorous and full of talent.

Mr. William Watkin Williams, architect, of Swansea, died recently at the age of thirty-eight. He was at one time a working mason, having been apprenticed to Messrs. Walters & Johns, builders, Morriston. He was a student at the Swansea Art School under Mr. F. F. Hosford; he designed the plans for very nearly all the new chapels in the district, among them being Capel Henrietta and Hill Chapel, Swansea, and a very large number in the Swansea Valley. At the present time his staff are engaged upon the English Wesleyan Chapel, Clydach, and Seion Chapel, Gorseinon. In addition to this the deceased prepared the plans for many schools, including the Wern School, Ystalyfera, the Alltwen Schools and the Pontardawe Schools.

The Roof of Penn Parish Church, Bucks, being in a dilapidated and unsound condition, is proposed to be repaired. The tower also needs attention.

Change of Address.—Mr. Robert J. Beale, architect and surveyor, has removed his offices from Broadway House, Westminster, to No. 17, Old Queen Street, Westminster.

Exeter Old City Wall.—It is distressing to learn that a large portion of the old City wall at Exeter has been taken down at the end of Fore Street.

The Scenes of "The Girl from Maxim's," the new play at the Criterion, have been furnished by Messrs. Oetzmänn & Co., of Hampstead Road, W. They show us a cosy substantial study in old oak and tapestry, and a room with gilt furniture and blue silk brocade, in a beautiful old château in Touraine.

Brinkworth Parish Church is being restored. Mr. Kite is the contractor. Under the wooden flooring was found a fragment of carved stone, which the architect (Mr. C. E. Ponting) thinks is the rim of an ancient Saxon font—a proof that on the site of the present edifice a Saxon church had existed.

A **New Weir** at Penton Hook, near Chertsey, has been completed by the Thames Conservancy, and is now in working order. The building has a covered-way roofed with shingles, and the water-controlling panels are raised or lowered by shafting. A gauge weir is also in course of construction lower down the river, and the channel in the vicinity of the locks has been deepened.

The **Southern Annexe of Manchester Cathedral** is to be completed so as to provide a new library and vestries for the choir and clergy, and to restore to the area of the cathedral the Jesus or Byrom Chapel at present screened off and used for the above purposes. The work, for which about £3,000 will be required, will be a memorial of the late Sir J. W. Maclure, M.P., who was the means of raising between £30,000 and £40,000 for the restoration and enlargement of the cathedral.

COMING EVENTS.

Wednesday, April 2.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. James Millar, I.A., on "The Glasgow International Exhibition of 1901," 8 p.m.

Thursday, April 3.

CIVIL AND MECHANICAL ENGINEER'S SOCIETY.—Mr. E. Ault on "Ventilation of Sewers," 8 p.m.

Friday, April 4.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. E. Worth, M.I.O.E., on "Sewerage."

INSTITUTION OF JUNIOR ENGINEERS.—Mr. G. Drysdale Sweetman on "Notes on Modern Lighthouse Construction," 8 p.m.

Saturday, April 5.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to the Lauder Technical School, Danfermline.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at Carpenters' Hall, E.C., at 6 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at the Sewage Outfall Works, Barking, at 3 p.m., conducted by Mr. John E. Worth, M.I.O.E.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Annual General Meeting at 7.30 p.m.

Monday, April 7.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. E. Worth, M.I.O.E., on "Sewage Disposal," 7 p.m.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. W. Aumonier and Mr. Heywood Sumner on Inlay and Marquetry," 8 p.m.

SOCIETY OF ENGINEERS.—Meeting at 7.30 p.m.

BIRMINGHAM AND DISTRICT CLERK OF WORKS' AND BUILDERS' FOREMEN'S ASSOCIATION.—Mr. W. H. Whitehouse, A.M.I.O.E., on "The Great Pyramid," 8 p.m.

Tuesday, April 8.

SOCIETY OF ARTS (Applied Art Section).—Prof. Beresford Pite on "Street Architecture," 8 p.m.

Wednesday, April 9.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. E. Worth, M.I.O.E., on "Scavenging, Disposal of House Refuse," 7 p.m. Inspection and Demonstration in the District of Islington, and at the Borough Disinfecting Station at 2 p.m., conducted by Mr. James R. Leggett.

INSTITUTION OF CIVIL ENGINEERS.—Students Visit to the Works of Messrs. Doulton & Co., Ltd., High Street, Lambeth, S.E.

New Companies.

Essex Decorating Co., Ltd.

Registered to carry on in the United Kingdom or elsewhere the businesses of builders and decorators. Capital £500 in £1 shares. Registered office: Cameron Road, Seven Kings, Ilford, Essex.

Natal Coalfields, Ltd.

Registered to carry on business as coalmasters colliery owners, dealers in and with coal, clay and mineral products of all kinds; as brick tile, and pipe makers, &c. Capital £30,000 in £1 shares.

Severn Valley Coal Syndicate, Ltd.

Registered to acquire any mines, &c., in the county of Shropshire, and to carry on the general businesses of coal and iron masters, brick and tile makers, &c. Capital £10,000 in £1 shares. The directors are G. Bridges and J. Barnes. Registered office: 794, Salisbury House, London Wall.

Crittall & Winterton, Ltd.

Registered to adopt an agreement with F. H. Crittall and W. S. Winterton for the acquisition of the business carried on at Bank Street and High Street, Braintree, by Crittall & Winterton, and to carry on the general business of iron-mongers, heating and sanitary engineers, tool makers, brassfounders, copper and white smiths, metal workers, &c. Capital £13,000 in £5 shares, 150 of which are founders' shares. The directors are S. C. Parmenter, F. H. Crittall and W. S. Winterton.

Grangetown Land and Building Co., Ltd.

Registered to acquire certain freehold land, containing 17,864 sq. yds. or thereabouts, at Grangetown, Yorkshire; to erect and maintain any houses, shops, factories, warehouses and other buildings; as builders, contractors, decorators, merchants, dealers in stone, sand, lime, bricks, timber and other building requisites, and as brick, tile, pipe and terra-cotta makers. Capital £25,000 in £5 shares. The directors are J. A. Macfarlane (chairman), W. Bastiman, D. Mackay and J. M. Bottomley.

Small Dwellings Acquisition Co., Ltd.

Registered to erect dwellings suitable for the occupation of artisans, labourers, clerks and others; to erect shops and other buildings; to lay out land for building purposes; to enter into any contracts with builders, tenants and others; to negotiate loans. Capital £100,000 in £1 shares. The directors are T. Wrightson, Bart. (chairman); Hon. C. G. Hay, M.P.; Sir A. Hickman, M.P.; H. R. Graham, M.P.; Captain H. M. Jessel, M.P.; E. R. P. Moon, M.P.; H. P. Pease, M.P.; W. B. Peat; Hon. W. R. Wellesley Peel, M.P., and Sir W. B. Richmond, K.C.B., R.A.

Rawson, Hubbard & Co., Ltd.

Registered to adopt an agreement with Arthur Rawson and J. C. Hubbard for the acquisition of the business, undertaking, assets and liabilities of Rawson, Hubbard & Co., as now and hitherto carried on at Tudor Works, Manor Road, Stoke Newington, and generally to carry on business as wood-carvers, woodworkers, moulding manufacturers, timber merchants and growers, sawmill proprietors; also as builders and decorators, plumbers, carpenters, furniture and cabinet manufacturers, upholsterers, &c. Capital £3,000 in £1 shares. Governing directors, A. Rawson and J. C. Hubbard. Registered office: 14, Manor Road, Stoke Newington.

Osmaston Estate, Ltd.

Registered to acquire certain lands in the parish of Osmaston, in the extended county borough of Derby known as the Osmaston Estate; to acquire lands and buildings of any tenure; to develop the Osmaston Estate; as builders and contractors, builders' merchants, dealers in stone, sand, lime, bricks, timber, hardware, brick, tile and terra-cotta manufacturers, decorators, plumbers and glaziers, house agents,

&c. Capital £100,000 in £1 shares. The directors are W. Bemrose, Sir H. H. Bemrose, Henry Litherland, H. T. Alton, W. W. Bemrose, T. Fletcher, C. R. B. Eddowes and A. C. Bemrose. Registered office: Babington Buildings, Derby.

CURRENT MARKET PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	—
Clover, best ..	do.	4 15 0	5 10 0
Hay, best	do.	5 5 0	5 12 6
Sainfoin mixture ..	do.	4 10 0	5 5 0
Straw	do.	1 8 0	2 0 0

OILS AND PAINTS.

Castor Oil, French ..	per cwt.	1 7 0	1 8 7
Colza Oil, English ..	do.	1 7 0	—
Copperas	per ton	2 0 0	—
Lard Oil	do.	2 9 6	—
Lead, white, ground, carbonate ..	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels ..	do.	1 10 6	—
Petroleum, American ..	per gal.	0 0 6½	0 0 7
Do. Russian	do.	0 0 6½	0 0 6½
Pitch	per barrel	0 7 0	0 7 6
Shellac, orange	per cwt.	5 16 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 11 0	1 11 6
Tar, Stockholm	per barrel	1 3 6	—
Turpentine	per cwt.	1 11 3	—

METALS.

Copper, sheet, strong ..	per ton	71 0 0	—
Iron, Staffs., bar	do.	6 5 0	8 10 0
Iron, Galvanised Corrugated sheet ..	do.	11 12 6	11 15 0
Lead, pig, Soft Foreign ..	do.	11 10 0	—
Do. do. English common brands ..	do.	11 16 3	—
Do. sheet, English 3lb per sq. ft. and upwards ..	do.	13 0 0	—
Do. pipe	do.	13 10 0	—
Nails, cut clasp, 3in. to 6in. ..	per ton	9 0 0	—
Do. floor brads	do.	8 15 0	—
Steel, Staffs., Girders and Angles	do.	5 15 0	6 5 0
Do. do. Mild bars	do.	6 10 0	7 0 0
Tin, Foreign	do.	117 0 0	117 10 0
Do. English ingots	do.	119 10 0	120 0 0
Zinc, sheets, Silesian ..	do.	21 0 0	—
Do. do. Vieille Montaigne ..	do.	21 10 0	—
Do. Spelter	do.	17 12 6	17 17 6

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel ..	per load 2	1 0	—
Pine, Quebec, Yellow ..	per load 4	7 6	6 0 0
Do. Pitch	do.	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 10
Do. Petersburg	per bundle	0 8	—
Deals, Archangel 2nd & 1st per P. Std.	15 5 0	22 0 0	—
Do. do. 4th & 3rd ..	do.	10 15 0	12 10 0
Do. do. unsorted ..	do.	5 12 6	6 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow ..	do.	13 15 0	—
Do. do. 2nd	do.	10 0 0	13 15 0
Do. do. White	do.	7 5 0	11 10 0
Do. Swedish	do.	9 15 0	15 10 0
Deals, White Sea	do.	10 10 0	11 15 0
Do. Quebec Pine, 1st ..	do.	19 10 0	21 5 0
Do. do. 2nd	do.	9 0 0	18 10 0
Do. do. 3rd &c.	do.	12 0 0	—
Do. Canadian Spruce, 1st ..	do.	7 10 0	9 5 0
Do. do. 3rd & 2nd ..	do.	7 5 0	9 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 5 0	10 15 0
Flooring Boards ..	lin.	—	—
Do. prepared, 1st ..	per square	0 10 3	0 11 6
Do. 2nd	do.	0 9 9	0 10 6
Do. 3rd &c.	do.	0 9 0	0 11 6

HARD WOODS.

Ash, Quebec	per load 3	17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, lin., Cuba ..	per ft. sup.	0 4 5	—
Do. Honduras	do.	0 0 18	—
Do. Tobasco	do.	0 0 18	—
Elm, Quebec	per load 0	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0 0 4½	—
Do. African	do.	0 0 3½	—
Do. St. Domingo ..	do.	0 0 5½	—
Do. Tobasco	do.	0 0 3½	—
Do. Cuba	do.	0 0 4½	—
Oak, Dantzic and Memel ..	per load 3	15 0	5 7 6
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ..	do.	6 0 0	17 10 0
Wainscot, Riga (Baulk) ..	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ..	per cub. ft.	0 3 1	—

Bourne End Abbey.—In view of the excavations recently made under the auspices of the Royal Archaeological Institute on the site of the Bourne End Abbey, Buckinghamshire, Mr. Vaughan Williams, the owner of the property, announces that he is willing to allow visitors to inspect the site of the ruins and objects of interest that have been discovered. Each visitor will be charged 1s., and the amount realised will be devoted to the restoration of Little Marlow Church.

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THE MANAGER, BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
April 3	Barnsley—Two Dwelling Houses	Co-operative Society, Ltd.	Wade & Turner, 10 Pitt Street, Barnsley.
" 3	Batley—Stables, Chopping-rooms, Sheds, &c. .. .	Electric Light and Power Committee	H. Buckley, 85 Commercial Street, Batley.
" 3	Colchester—Extension of Boiler and Engine Houses ..	Electricity Committee	H. Goodyear, Borough Engineer, Town Hall, Colchester.
" 3	Manchester—Brick Viaduct	Corporation	City Surveyor, Town Hall, Manchester.
" 3	Nuide, Scotland—Shooting Lodge	Urban District Council	A. Mackenzie, Architect, County Buildings, Kingussie.
" 3	Summerhouse—Two Cottages	Corporation	J. Clarkson, Summerhouse.
" 3	Sunderland—Two Houses	Urban District Council	W. & T. R. Milburn, 20 Fawcett Street, Sunderland.
" 3	Weston-super-Mare—Structural Alterations	Corporation	H. Nettleton, Surveyor, Town Hall, Weston-super-Mare.
" 3	Kineton—Wesleyan Minister's House	Corporation	A. Fairfax, Solicitor, Banbury.
" 3	Kingston-upon-Thames—Additions, Technical Schools ..	Corporation	Borough Surveyor, Clattern House, Kingston.
" 3	Henblas, Barmouth—Four Houses	Corporation	Mrs. Price, Glasfryn House, Barmouth.
" 3	Harlech—Alterations, &c., to Inn	Captains E. James and D. H. Jones	Mr. Williams, Lion Hotel, Harlech.
" 4	Aberystwyth—Two Houses	Corporation	T. E. Morgan, Architect, Aberystwyth.
" 4	Chichester—Lavatories, Retiring Rooms, &c. .. .	Rural District Council	City Surveyor, Lion Street, Chichester.
" 4	Clonakilly, Ireland—Seven Cottages	Working Men's Club and Institute	W. H. Spiller, Clerk, Council Office, Clonakilly.
" 4	Overton, near Lancaster—Church Restoration	Consett Iron Co., Ltd.	Austen & Paley, Architects, Castle Park, Lancaster.
" 4	Dartford, Kent—Concert Hall, &c.	Corporation	H. E. Bennett, Secy., Westgate House Club and Institute, Dartford.
" 4	Leadgate, Durham—Reconstructing Cottages	Corporation	C. E. Oliver, Company's Architect, Consett.
" 4	Sandbach—Villa	North-Eastern Railway Co.	A. Price, Architect, Sandbach.
" 4	York—Offices	Primitive Methodists Trustees	W. Bell, Company's Architect, York.
" 4	Barford, near Salisbury, Wilts—Chapel and School ..	W. Wagner	D. Burch, Barford.
" 5	Hayle—Additions, &c., to Residence	Rural District Council	S. Hill, Architect, Green Lane, Reilruth.
" 5	Midleton, Ireland—135 Labourers' Cottages	County Council	R. Evans, 53 South Mall, Cork.
" 5	Helston, Cornwall—Police Station, &c.	R. Slinger & Son	O. Caldwell, Architect, Victoria Square, Penzance.
" 5	Preston—Business Premises	Colonel Aspinall	R. Walker, 164 Friargate, Preston.
" 5	Aylesbury Church—Roof Repairs, &c.	School Board	G. H. Manning, 6 Walton Street, Aylesbury.
" 5	Clitheroe—Alterations, &c., to House	Urban District Council	W. Dawson, Castle Street, Clitheroe.
" 5	Croydon—Alterations, &c., to Schools	Corporation	B. Rule, Clerk, Katherine Street, Croydon.
" 5	Millsbridge, near Huddersfield—Pair of Villas	District Council	T. H. & F. Healey, Architects, Tyrril Street, Bradford.
" 5	Neath, Wales—Inn	Urban District Council	J. O. Rees, Architect, St. Thomas Chambers, Neath.
" 5	Pontypool—Additions to School	Corporation	B. Lawrence & Son, Architects, Austin Friars Chambers, Newport.
" 5	Pontypool—Rebuilding Hotel	G. D. Brendon	A. O. Evans, Architect, Pontypool.
" 5	St. Mary Bourne, Hants—Movable Partition	Corporation	S. Clarke, Clerk, Whitechurch, Hants.
" 5	Wingate—Church and School	Harbour Commissioners	H. T. Gradon, Architect, Market Place, Durham.
" 5	Pontnewynydd, Wales—Enlarging Church	Town Council	Rev. G. H. Southall, Alexandra House, Wainfein Road, Pontypool.
" 5	Edenderry—Labourer's Cottage	Whickham Urban District Council	Mr. Waters, Engineer, Edenderry.
" 5	Linthorpe, Middlesbrough—Detached Residence	Earl of Morley	R. Lofthouse & Sons, 62 Albert Road, Middlesbrough.
" 7	Llandudno—Extension of Electric Lighting Station ..	Burial Board	E. F. Stevenson, Surveyor, Town Hall, Lloyd Street, Llandudno.
" 7	Blackpool—Public Mortuary	Urban District Council	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 7	Woodland, near Callington—House	Corporation of London	J. Sansom, Architect, Liskeard.
" 7	Workington—Six Houses	Corporation	W. G. Scott & Co., Architects, Victoria Buildings, Workington.
" 7	Selby—Church Works	Harbour Commissioners	J. O. Scott, 2 Dean's Yard, Westminster, S.W.
" 7	Penygraig, Wales—Chapel, &c.	Town Council	Griffiths & Jones, Architects, Excelsior Buildings, Tonypandy.
" 7	Manchester—Two Electricity Sub-Stations	Whickham Urban District Council	City Surveyor, Town Hall, Manchester.
" 7	Belfast—Shed	Earl of Morley	G. F. L. Giles, Harbour Engineer, Belfast.
" 7	Croydon—Cottage	Burial Board	Deputy Engineer, Town Hall, Croydon.
" 7	Dunston, Gateshead—Public Mortuary	Urban District Council	J. B. Benton, Council's Surveyor, Parish Offices, Whickham.
" 7	Great Woodford, Devon—Pair of Cottages	Urban District Council	W. J. Carder, 8 Athenaeum Terrace, Plymouth.
" 7	Cockermouth—Greenhouse	Corporation of London	J. D. Kirkbride, Curator, Cemetery, Cockermouth.
" 7	Nantwich—Electric Works & Refuse Destructor Bldgs. ..	Corporation of London	W. F. Newey, Market Street, Nantwich.
" 7	Macroom—Town Hall	Union Guardians	T. Murphy, Clerk, Council Offices, Macroom.
" 8	Denton, near Gravesend—Hospital Block	Lunatic Asylum Committee	City Surveyor, Guildhall, E.C.
" 8	Resolven, Wales—Villa	Congregation Chapel Committee	J. L. Smith & Davies, Architects, Aberdare.
" 8	Beaminster, Dorset—Institute and Public Hall	School Board	K. Tson & Trotman, Fleet Street, Beaminster.
" 8	Upper Edmonton—Married Quarters at Workhouse ..	School Board	A. A. Kerwick, 18 Outer Temple, Strand, W.C.
" 9	Bradford—Shed	School Board	Empsall & Clarkson, 7 Exchange, Bradford.
" 9	Derby—Stone Wall, Railing, &c.	School Board	J. Ward, Borough Surveyor, Basington Lane, Derby.
" 9	Lismullen, Ireland—Church	School Board	F. Shaw, Architect, Drogheda.
" 9	Omagh, Ireland—Post Office	School Board	J. L. Donnelly, Town Surveyor, Omagh.
" 9	Griffithstown, Wales—Classrooms, &c.	Rural District Council	Lansdowne & Griggs, Architects, Newport.
" 9	Walsall—Bricks, Cement, &c.	Wesleyan Trustees	F. W. Mager, District Surveyor, Aldridge, Walsall.
" 10	Middleton-on-the-Wolds—Chapel and Schools	Metropolitan Asylums Board	Gelder & Kitchen, 76 Lowgate, Hull.
" 10	London, N.—Gate Porter's Lodge, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
" 10	Hither Green, S.E.—Engineer's Cottage	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
" 10	Hawthorn, Yorks—Chapel, &c.	Union Guardians	Walker & Collinson, Architects, Swan Arcade, Bradford.
" 10	Mansfield—Organ Chamber, &c.	Lunatic Asylum Committee	C. H. Fowler, Architect, Durham.
" 11	Salford—Nurses' Home	Congregation Chapel Committee	H. Lord, 42 Deansgate, Manchester.
" 11	Belfast—Pair of Semi-detached Villas	School Board	Blackwood & Jury, 41 Donegall Place, Belfast.
" 12	Belfast—Two Villas	School Board	Graeme-Watt & Tulloch, 77A Victoria Street, Belfast.
" 12	Kilcoe, Ireland—Church	School Board	M. A. Hennessy, 74 South Mall, Cork.
" 14	Rhoslanerchrugog, Wales—Schools and Classrooms ..	School Board	No. 54 Hall Street, Rhoslanerchrugog.
" 14	Old Brentford—Schools	School Board	N. Parr & A. E. Kates, 5 Brent Road, Brantford, W.
" 14	Ilford, Essex—School	School Board	C. J. Dawson, 7 Bank Buildings, Ilford, Essex.
" 14	Walthamstow—Alterations, &c., to Schools	School Board	H. Prosser, Board Offices, High Street, Walthamstow.
" 15	West Kilbride, Scotland—Slaughter House	Ayrshire County Council	A. McQuaker, Architect, Glenbank, Dalry.
" 15	Aldershot—Eight Cottages, Stabling, &c.	County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
" 15	Barton-on-Humber—Mission Church	Lambeth Guardians	H. B. Bell, 8 Park Square, Leeds.
" 15	London, S.E.—Offices, Nurses' Home, &c.	Admiralty	Fowler & Hugman, 9 Craig's Court, Charing Cross.
" 18	St. Anthony's Point, nr. Falmouth—Coastguard Bldgs. ..	School Board	Director of Works Dept., Admiralty, 21 Northumberland Av., W.C.
" 19	Gelligaer, Wales—Repairs, &c., to Schools	School Board	James & Morgan, Architects, Charles Street Chambers, Cardiff.
" 19	York—Church Restoration	School Board	Boreham & Morton, 24 John Street, Sunderland.
" 21	Gloucester—Infants' School	Union Guardians	H. Medland, 15 Clarence Street, Gloucester.
" 22	Tendring, Essex—Alterations, &c., to Workhouse ..	Union Guardians	A. J. H. Ward, 42 Church Street, Harwich.
No date.	London, S.W.—Detached Residence	Union Guardians	H. Davies, 124 Holborn, E.C.
ENGINEERING:			
April 3	Cannock, Staffs.—Hot-Water Supply	Workhouse Guardians	A. W. Carver, Clerk, Union Offices, Cannock.
" 4	Maidenhead—Wiring	Electric Lighting Committee	Burstable & Monkhouse, 14 Old Queen Street, Westminster, S.W.
" 4	Cardigan—Water Supply Works	Rural District Council	D. Davies, 25 Quay Street, Cardigan.
" 5	Bradford—Laundry Apparatus, &c.	Corporation	Mawson & Hudson, Architects, The Exchange, Bradford.
" 5	Wolverhampton—Machine Tools, &c.	Corporation	C. E. C. Shawfield, Borough Eng., Commercial Rd., Wolverhampton.
" 5	Cellardyke, Scotland—Harbour Works	Town Council	Jameson & Guthrie, Town Clerks, Anstruther.
" 7	Derby—Laying Mains	Waterworks Committee	J. Ward, Borough Surveyor, Basington Lane, Derby.
" 8	Bridlington—Road Bridge	North-Eastern Railway Co.	W. J. Cudworth, Company's Engineer, York.
" 8	Ennagh, Ireland—Rebuilding Retort Benches, &c. ..	Gas Consumers Co.	R. F. Byron, Secretary, Company's Offices, Ennagh.
" 9	Warrington—Electric Tramways	Corporation	Preece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 9	London, N.E.—Water Tube Boilers, &c.	Hackney Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 9	Bessingby—Road Bridge	North-Eastern Railway Co.	W. J. Cudworth, Company's Engineer, York.
" 9	York—Widening Railway	North-Eastern Railway Co.	W. J. Cudworth, Company's Engineer, York.
" 9	Oldham—Electrical Equipment	Tramways Committee	S. A. Pickering, Borough Surveyor, Town Hall, Oldham.
" 9	Oldham—Turntables, &c.	Tramways Committee	S. A. Pickering, Borough Surveyor, Town Hall, Oldham.
" 10	Manchester—Coal and Ash Conveyors	Corporation	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
" 10	Leeds—Water Main	Corporation	City Engineer, Town Hall, Leeds.
" 10	Alexandria, Egypt—Hydraulic Press	Director-General	Director-General of Customs, Alexandria.
" 12	Edinburgh—Cast and Iron Pipes, &c.	Lord Provost, Magistrates and Council	Resident Engineer, 5 Dewar Place, Edinburgh.
" 12	Falkirk—Electric Lighting Plant	Corporation	Burstable & Monkhouse, 14 Old Queen Street, Westminster, S.W.
" 12	Loughborough, Leics—Refuse Destructor, &c.	Town Council	A. H. Walker, Borough Engineer, Town Hall, Loughborough.
" 12	Stamford—Mainlaying	Waterworks Committee	J. Eunsom, Engineer, Northampton.
" 14	Stamford—Reservoir	Waterworks Committee	J. Eunsom, Engineer, Northampton.
" 14	Manchester—Steel Joists and Bridges	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
" 14	Manchester—Sluice Valves, Pipes, &c.	Medway Conservators	G. H. Hill & Sons, 3 Victoria Street, Westminster.
" 15	Rochester—Dredging	Stavanger Waterworks	Secretary, 42 High Street, Rochester.
" 15	Christiania—Pumps	Corporation	Stadsingeniørkontoret, Stavanger.
" 16	Devonport—Tramways	Corporation	C. Chadwell, 20 Victoria Street, Westminster.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
April 19	Manchester—Pumping Engines	Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester.
" 21	Almeria, Spain—Steel Pier	Alqui Mines and Railway Co., Ltd. ..	Formans & McCall, 160 Hope Street, Glasgow.
" 22	London, N.—Refuse-Destructor Plant ..	Tottenham Urban District Council ..	W. H. Prescott, 712 High Road, Tottenham, N.
" 22	London, E.C.—Engines, &c.	Bombay, Baroda & Central India Rly. Co.	T. W. Wood, Gloucester House, Bishopsgate Street Without, E.C.
" 25	West Hartlepool—Sewerage Works	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
" 26	Hull—Pumping Machinery	Corporation	F. J. Bancroft, City Engineer, Alfred Gilder Street, Hull.
" 28	George Town, Penang—Electrical Plant ..	Municipal Commissioners	Preece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 30	Trowbridge—Electric Lighting	Urban District Council	T. S. Hill, Clerk, Council Offices, Town Hall, Trowbridge.
May 1	Rathmines, Ireland—Engine-house Plant, &c..	District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 7	Sydney, N.S.W.—Electrical Plant, &c. ..	Municipal Council	Preece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
June 30	Sydney, N.S.W.—Bridge across Harbour ..	.. .. .	Under-Secretary for Public Works, Sydney.
IRON AND STEEL:			
April 3	India Office, S.W.—Carriage Ironwork ..	Secretary for India in Council	Director-General of Stores, India Office, Whitehall, S.W.
" 3	Southend-on-Sea—Lamp Columns	Corporation	W. E. J. Heenan, Borough Electrical Engineer, Southend.
" 5	Sunderland—Manhole Covers, &c.	Corporation	Borough Engineer, Town Hall, Fawcett Street, Sunderland.
" 9	London, E.C.—Railway Stores	East Indian Railway Co.	C. W. Young, Secretary, Nicholas Lane, E.C.
" 14	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
" 15	Christiania—Tools, &c.	State Railways	Commercial Department, Foreign Offices, S.W.
" 23	Calcutta—Stopcocks	Corporation	F. Gainsford, Secretary, Corporation Office, Calcutta.
PAINTING AND PLUMBING:			
April 3	Croydon—Painting Cemetery Fencing .. ..	.. .. .	Deputy Engineer, Town Hall, Croydon.
" 3	Salford—Painting Three Chapels .. .. .	.. .. .	Borough Engineer, Town Hall, Salford.
" 5	Sunderland—Oils, Paints, Varnishes, &c. ..	Corporation	Borough Engineer, Town Hall, Fawcett Street, Sunderland.
" 7	Croydon—Painting at Polytechnic	Town Council	Deputy Engineer, Town Hall, Croydon.
" 7	London, N.—Painting, &c. (Two Contracts) ..	Islington Borough Council	J. P. Barber, Borough Engineer, Town Hall, Upper Street, N.
ROADS AND CARTAGE:			
April 3	London, W.—Road Works	Ealing Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.
" 3	Portslade-by-Sea, Sussex—Flints	Urban District Council	Surveyor, 35 St. Andrew's Road, Portslade-by-Sea.
" 3	Portslade-by-Sea, Sussex—Street Works ..	Urban District Council	Surveyor, 35 St. Andrew's Road, Portslade-by-Sea.
" 3	Stafford—Forming Streets .. .. .	.. .. .	W. Campbell, Architect, Bagnall Street, Hanley.
" 3	Upholland, Lancs.—Materials and Team Labour	Urban District Council	C. E. Senior, Surveyor, Council Offices, Upholland.
" 3	Luton—Materials	Town Council	Borough Surveyor, Town Hall, Luton.
" 4	Eulcamp, Suffolk—Granite	Blything Rural District Council ..	H. A. Mullens, Clerk, Union Offices, Bulcamp.
" 5	Accrington—Street Works	General Works Committee	W. J. Newton, Borough Engineer, Town Hall, Accrington.
" 5	Clown, Chesterfield—Slag	Rural District Council	E. H. Barber, Surveyor, Hollin Hill, Clown, Chesterfield.
" 5	Pocklington, Yorks—Stone and Slag	Rural District Council	T. Robson, Clerk, Pocklington.
" 5	Stafford—Materials, &c.	County Council	J. Moncur, Chief Surveyor, County Buildings, Stafford.
" 5	Sunderland—Works and Materials	Corporation	Borough Engineer, Town Hall, Fawcett Street, Sunderland.
" 5	Maldon—Road Repair, &c.	Rural District Council	H. G. Keywood & E. J. Ennals, Public Hall Chambers, Maldon.
" 7	Dronfield, Yorks—Making-up	Urban District Council	T. H. Atkinson, Surveyor, Dronfield.
" 7	Louth, Lincs—Materials	Town Council	G. H. Allison, Borough Surveyor, Town Hall, Louth.
" 7	Colwyn Bay, Wales—Paving	Urban District Council	W. Jones, Surveyor, Council Offices, Colwyn Bay.
" 7	Erith, Kent—Street Works	Urban District Council	Council's Surveyor, Bexley Road, Erith.
" 7	Griffithstown, Wales—Road Works	Ponteg Urban District Council	J. Wallace, Surveyor, Sunny Bank, Griffithstown.
" 7	Rawmarsh, Yorks—Street Making	Urban District Council	W. J. Petch, Surveyor, Council Offices, Rawmarsh.
" 7	Tendering, Essex—Flints	Rural District Council	J. Bell, Highway Surveyor, Weeley, Colchester.
" 7	London, N.—Roads .. .. .	.. .. .	Vigers & Co., 1 Frederick's Place, Old Jewry, E.C.
" 8	Dover—Forming, Paving, &c., Road	Town Council	H. E. Stilgoe, Borough Engineer, Maison Dieu House, Dover.
" 8	St. Mellons, Cardiff—Materials	Rural District Council	J. Thomas, Clerk, Union Offices, Queen's Hill, Newport, Mon.
" 8	Salford—Paving, &c. .. .. .	.. .. .	Borough Engineer, Town Hall, Salford.
" 8	Southall, Middlesex—Gravel	Urban District Council	R. Brown, Engineer, Public Offices, Southall.
" 8	Lowestoft—Materials	Mutford and Loughland R.D.C.	F. G. Marsh, Surveyor, Victoria Road, Carlton Colville, Lowestoft.
" 8	Shoreham, Sussex—Flints	Steyning East Rural District Council ..	E. Cripps, Clerk, Council Offices, Ham Road, Shoreham.
" 8	Shoreham, Sussex—Flints and Granite	Steyning West Rural District Council ..	E. Cripps, Clerk, Council Offices, Ham Road, Shoreham.
" 9	Walsall—Materials	Rural District Council	F. W. Mager, District Surveyor, Aldridge, Walsall.
" 9	Kingston-upon-Thames—Road Works	Corporation	Borough Surveyor, Clatten House, Kingston-upon-Thames.
" 9	Leeds—Paving, &c., Goods Yard	North-Eastern Railway Co.	W. J. Cudworth, Company's Engineer, York.
" 9	London, E.—Making-up Road	Poplar Borough Council	Borough Engineer, Council Offices, High Street, Poplar.
" 10	London, S.E.—Repairing Roads, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 11	Cradley Heath—Forming, &c., Road	Rowley Regis Urban District Council ..	D. Wright, Council Office, Lawrence Lane, Old Hill, Cradley Heath.
" 12	Kiveton Park, Sheffield—Slag	Rural District Council	J. P. Evans, Surveyor, Council Offices, Kiveton Park Stn., Sheffield.
" 14	Bexhill—Stone	Urban District Council	G. Ball, Surveyor, Town Hall, Bexhill.
" 14	Bexhill—Making-up Roads	Urban District Council	G. Bell, Surveyor, Town Hall, Bexhill.
" 14	Coventry—Granite Setts	General Works Committee	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 14	Dartford—Wood Paving	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 14	Sudbury, Suffolk—Granite	West Suffolk County Council	A. A. Hunt, County Surveyor, Sudbury.
" 15	Hambledon, Guildford—Materials, &c. ..	Rural District Council	G. Lintott, Council's Surveyor, Cranleigh.
SANITARY:			
April 3	Portslade-by-Sea, Sussex—Sewers	Urban District Council	T. Austen, Clerk, Council Office, Portslade-by-Sea.
" 5	London, S.W.—Drainage Works	Fulham Borough Council	Medical Officer of Health, Town Hall, Fulham.
" 7	Houghton-le-Spring, Durham—Drainage Works	Urban District Council	V. Smith, 14 Newbottle Street, Houghton-le-Spring.
" 9	London, W.—Sewer	Kensington Borough Council	Borough Engineer, Town Hall, Kensington High Street, W.
" 9	Walsall—Disinfectants, Stoneware Goods, &c.	Rural District Council	F. W. Mager, District Surveyor, Aldridge, Walsall.
" 9	Foleshill, near Coventry—Drainage Works ..	Rural District Council	C. N. Lailey, 6 The Sanctuary, Westminster.
" 10	Wilmslow—Sewer, &c.	Urban District Council	A. S. Cartwright, Surveyor, Council Offices, Wilmslow.
" 16	Tarporley, Cheshire—Sewers	Urban District Council	B. Latham, Parliament Mansions, Victoria Street, Westminster.
TIMBER:			
April 5	Sunderland—Timber	Corporation	Borough Engineer, Town Hall, Fawcett Street, Sunderland.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
" 8	Oldham—Market Hall and Shops	£50, £30, £20.	S. A. Pickering, Borough Surveyor, Oldham.
" 21	Coleraine—Twenty-five Workmen's Dwellings ..	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
" 30	Glasgow—Branch Library (Local Architects) ..	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 1	York—Queen Victoria Memorial	£50.	W. H. Andrew, Town Clerk, Guildhall, York.
" 1	Mexborough, near Rotherham—Accident Hospital ..	£35 £10.	C. Brampton, Fern Villa, Mexborough.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 1	Knarsborough—Infectious Disease Hospital ..	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire Brigade Buildings ..	£100, £50 £25.	Borough Engineer, Town Hall, Sunderland.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River ..	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No cat.	Ilkeston—Public Free Library	£30, £25, £12 10s.	H. J. Kilford, Borough Surveyor, Town Hall, Ilkeston.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ALDERSHOT.—For sewer in St. George's Road:—

Martin & Wells... £158 0 0
William Norris... 128 10 0
James Lawson,* South Farnborough... 103 17 0
* Accepted.

BRENTWOOD.—Accepted for repairs to "The Spread Eagle," Brentwood. Messrs. Foulsham & Herbert Riches, architects, 3 Crooked Lane, London, E.C., and Bromley-by-Bow, E.—

T. Bruly... £286

CROYDON.—For the erection of a pair of semi-detached houses in Brighton Road, Purley (first pair). Mr. Frank Windsor, architect, 9 and 10 Bank Buildings, George Street, Croydon:—

J. Horrocks... £1,800 | Ludlow & Martin... £1,525
F. Clark... 1,380

EAST STANLEY (DURHAM).—For the erection of school buildings for the Tanfield (U.D.) School Board. Mr. W. H. Bandle, architect, 33 Grainger Street West, Newcastle-on-Tyne. Quantities by architect:—

G. T. Manners... £3,003 0
Reay & Sons... 2,910 0
A. & R. Davis... 2,883 14
A. Routledge... 2,850 0
E. Taylor,* Durham... 2,785 3
* Accepted.

ELTHAM (KENT).—For the erection of new depot for the London Parcels Delivery Company, Ltd., High Street, Eltham, Kent. Mr. Henry Poston, architect, 39 Lombard Street, E.C.:—

W. Shepherd... £3,450 | Jerrard & Son... £3,073
T. Knight... 4,319 | Blyton & Sons,* Kennington 3,025
* Accepted.

FENNY STRATFORD.—For the execution of sewerage and sewage-disposal works within their district, for the Fenny Stratford Urban District Council. Mr. John Chadwick, C.E., engineer, Blechley, Bucks. Contract No. 1 comprising the construction of covered sewage tanks, bacteria beds, storm water filter, the preparation of land, and other work: (2) comprising the construction of sewers, ejector chambers, manholes, flushing tanks, and other work: (3) comprising the laying of cast-iron sewage and air mains, and the erection of sewage ejectors, air compressors, and engines and other work:—

G. Bell... £10,203 0 0
W. Manders... 9,364 7 2

J. Jackson... 8,508 18 4
J. & T. Binns... 8,459 11 1
W. York, Green, & Co... 8,300 11 3
Lock & Andrews... 8,061 10 0
J. Cunliff... 7,987 11 0
G. Carden... 7,804 7 8
Bower Bros... 7,075 0 0
Grounds & Newton... 7,541 10 7
Siddons & Freeman*... 7,050 0 0
R. L. Tonge... 6,300 0 0

Contract No. 2.

J. Jackson... 7,442 9 2
W. York, Green, & Co... 7,884 13 0
G. Bell... 7,204 7 8
Bower Bros... 7,161 0 0
J. & T. Binns... 7,035 12 0
W. Manders... 6,735 14 3
Lock & Andrews... 6,622 13 8
Siddons & Freeman... 6,400 0 0
G. Carden... 6,349 16 8
R. L. Tonge... 6,320 0 0
Grounds & Newton*... 6,114 14 0

Contract No. 3.

J. & T. Binns... 4,090 18 3
J. Jackson... 3,848 11 5
Hughes & Lancaster... 3,792 9 0
J. Cunliff... 3,699 12 9
Bower Bros... 3,474 0 0
Siddons & Freeman*... 3,389 0 0
* Accepted.

GRAYS (ESSEX).—For carrying out alterations and additions to The Elms, Grays, and putting in a system of hot-water heating. Mr. Christopher M. Shiner, architect, 3 Bond Court, Walbrook, E.C.:—

W. Potter... £1,650 | J. J. Lawrence... £1,545
Hammond & Son... 1,559 | J. Brown*... 1,470
* Accepted.

HARROW.—For additions to Greenhill Laundry. Mr. S. J. Reynolds, Reigate, consulting engineer. Chimney and Boiler Seating.

Cross & Co... £700 0 0
Poulton & Son*... 710 10 0

Sorting and Drying Rooms and Boiler House.

Funnell & Co... £2,726 0 0
Lucy & Eyden... 2,550 0 4
Drake & Son... 2,350 0 0
Kiddle & Son... 2,303 0 0
Akers & Co.*... 2,187 0 0
* Accepted.

LEYTON.—For the erection of a new factory, Beaumont Road, Leyton, for Mr. W. H. Newall. Mr. W. A. Finch, architect, 70 Finsbury Pavement, E.C.:—

T. L. Green... £2,705 | Perry Bros... £2,477
Lawrance & Sons... 2,702 | C. North... 2,455
S. Kind... 2,640 | Barrett & Power... 2,372
Shurmar & Sons... 2,493

LONDON.—For sanitary and drainage works at Pulteney School, Berwick Street, Soho, for the London School Board. Mr. T. J. Bailey, architect:—

G. Neal... £2,145 0 | J. Peattie... £1,088 0
Johnson & Co... 2,112 0 | R. P. Beattie*... 1,704 18
L. H. & R. Roberts... 1,994 0
* Recommended for acceptance.

LONDON.—For additions to stabling, Streatham Common, S.W. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, E.C.:—

Courtney & Fairbairn... £549 | J. Smith & Sons, Ltd... £439
W. Mason... 405 | G. Candler & Sons*... 490
* Accepted.

LONDON.—For internal decorations, house, Streatham Common, S.W. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, E.C.:—

J. Smith & Sons, Ltd... £668 | Maple & Co., Ltd.*... £593
G. Candler & Sons... 647 | * Accepted.

LONDON.—For repairs, &c., to the "Joiners' Arms," Stratford, E. Messrs. Foulsham & Herbert Riches, architects, 3 Crooked Lane, King William Street, E.C., and Bromley-by-Bow, E.:—

A. Webb... £345 | J. T. Robey... £205
T. Osborn & Sons... £327 | E. F. & T. J. Walker*... 237
* Accepted.

LONDON.—For drainage and sanitary works at Pocock Street School, Blackfriars, for the London School Board. Mr. T. J. Bailey, architect:—

J. & M. Patrick... £5,217 | J. & C. Bowyer... £3,937
Rice & Son... 3,203 | Johnson & Co... 2,935
H. Leney & Son... 3,194 | J. W. Falkner & Sons... 2,303
Maxwell Bros., Ltd... 3,170 | G. Parker*... 2,375
W. Downs... 3,060 | * Recommended for acceptance.

LONDON, E.—For the erection of the "Carters' Arms," Beckton Road, Canning Town, for Messrs. Savill Bros., Limited. Mr. Henry Poston, architect, 39 Lombard Street, E.C.:—

A. E. Symes... £1,650
Told and Newman... 1,587
Blyton & Sons... 1,510
W. J. Maddison,* Canning Town... 1,435
For three cottages adjoining above.
W. J. Maddison... 980
* Accepted.

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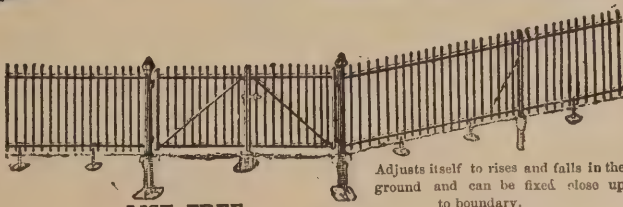
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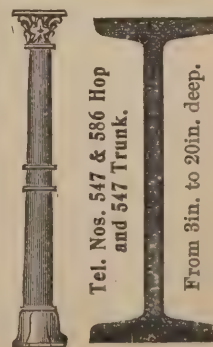
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LONDON.—For the erection of stabling, Wanstead, W.C. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, E.C. —
 T. Osborn & Sons ... £720 C. J. Sherwood ... £201
 W. Mundy ... 702 Bailey, Son & Holmes ... 635
 * Accepted.

LONDON.—For the erection of a new school, Townmead Road site, Fulham, for the London School Board. Mr. T. J. Bailey, architect—
 C. Miskin & Sons ... £28,187 C. Cox ... 25,210
 Lathley Bros. ... 26,547 Kirk & Randall ... 25,210
 J. Simpson & Son ... 26,222 McCormick & Sons ... 25,210
 Leslie & Co., Ltd. ... 26,101 Stimpson & Co. ... 24,600
 F. Gough & Co. ... 26,111 J. Smith & Sons, Ltd. ... 24,500
 G. E. Wallis & Sons ... 25,548 Spencer, Santo & Co., Ltd. ... 24,554
 E. Lawrence & Sons ... 25,519 W. H. Lorden & Son ... 24,444
 J. & M. Patrick ... 25,390 Holloway Bros. ... 24,400
 W. King & Son ... 25,240 W. Johnson & Co., Ltd. ... 23,950
 Treasure & Son ... 25,218 * Recommended for acceptance.

LONDON, E.—For the erection of a block of buildings on the Queen Catherine Court Area, Dorset Street, Limehouse, E., for the Stepney Borough Council. Mr. W. Jameson, borough engineer—

Holliday & Greenwood, London, S.W. ... £26,877
 Martin, Wells & Co., Vauxhall, S.E. ... 5,815
 J. Chessum & Sons, Bow, E. ... 5,909
 H. Lovatt, London, W. ... 5,873
 B. E. Nightingale, Lambeth, S.E. ... 5,765
 A. Porter, Tottenham, N. ... 5,795
 J. Smith & Sons, Ltd., South Norwood, S.E. ... 5,729
 Wilson Bros. & Lamplough, Kensal Rise, W. ... 5,905
 Dove Bros., Islington, N. ... 5,885
 Todd & Newman, London, N.E. ... 5,678
 H. N. Holloway, Deptford, S.E. ... 5,657
 C. G. Hill, London, E.C. ... 5,598
 F. G. Minter, Westminster, S.W. ... 5,587
 Patman and Potheringham, Ltd., Islington, N. ... 5,553
 Sabey & Son, Islington, N. ... 5,527
 R. & E. Evans, Peckham, S.E. ... 5,408
 * Accepted.

LONDON, S.W.—For officers' quarters and waiting hall at the receiving wards, Wandsworth Infirmary. Messrs. M. J. Lansdell, F.R.I.B.A., and E. J. Harrison, architects, 65 & 66 Basinghall Street, E.C.—

R. Neal, Plymouth ... £17,442 ... £242
 R. A. Jewell, Wandsworth ... 17,327 ... 250
 Wilson Bros. & Lamplough, Kensal Rise ... 17,184 ... 200
 Viney & Stone, Regent's Park ... 16,759 ... 50
 W. Keys, Tooting ... 16,684 ... 200
 Foster Bros., Norwood Junction ... 16,668 ... 85
 T. G. Sharpington, Nunhead ... 16,298 ... —
 W. Wallis, Balham ... 16,184 ... 100
 Lorden & Son, Upper Tooting ... 15,898 ... 111
 J. R. Ward, Battersea ... 15,547 ... —
 Sabey & Son, Islington ... 15,545 ... 100
 Smith & Son, Croydon ... 16,400 ... 200
 Whitehead & Co., Clapham Road ... 15,399 ... 424
 C. G. Hill, Coventry ... 15,355 ... 105
 Turtle & Appleton, Wandsworth ... 14,980 ... 250
 E. Triggs, Clapham ... 14,950 ... 200
 J. Appleby, Aquinas Street, S.E. ... 14,700 ... 50
 Edwards & Medway, Kennington ... 14,600 ... 170
 E. Chamberlain, Addlestone ... 14,478 ... 35
 * Accepted. A—Old materials.

LONDON, W.—For sewerage, levelling, paving, installing, flagging, channelling, providing means of lighting, and making-up Shirley Gardens and the footways thereof, for the Hanwell Urban

District Council. Mr. Sidney W. Barnes, A.M.I.C.E., surveyor, Church Road West, Hanwell, W.—
 H. Boyer ... £1,441 1 0
 B. Nowell & Co. ... 1,380 9 9
 H. Morecroft ... 1,290 0 0
 Felkin & Watson ... 1,260 0 0
 Lawrence & Thacker ... 1,241 8 11
 J. Macklin ... 1,223 6 11
 G. Wimpey & Co. ... 1,218 5 0
 R. Ballard, Ltd. ... 1,217 1 9
 H. Woodhams & Sons ... 1,180 14 5
 W. Neave & Son ... 1,105 10 0
 [Surveyor's estimate, £1,255 9 9]
 * Accepted.

MANOR PARK (ESSEX).—For the erection of new "Earl of Essex" Hotel, Manor Park, Essex, for Mr. Joseph Hill Mr. Henry Poston, architect, 39 Lombard Street, E.C. Quantities by Mr. J. Rookwood, 25 Bedford Row, W.C.—

Contract No. 1.—Foundations and substructure.
 Blyton & Sons ... £1,550 Todd & Newman ... £1,360
 Mowlem & Co. ... 1,507 W. J. Maddison, Canning ... 1,285
 Hall, Beddall, & Co. ... 1,462 Town ... 1,285

Contract No. 2.—Superstructure.
 Hall, Beddall, & Co. ... £13,800 Blyton & Sons ... £13,515
 J. Mowlem & Co. ... 13,093 W. J. Maddison ... 13,355
 Todd & Newman ... 13,001
 * Accepted.

NORWICH.—For the erection of the Silver Road Schools, Norwich, for the Norwich School Board. Mr. C. J. Brown, architect, Cathedral Offices, Norwich—

Haydon & Daniels ... £14,931 0 J. S. Smith ... £14,290 0
 Scaries Bros. ... 14,900 0 S. Chapman & Son ... 13,795 0
 Downing & Son ... 14,740 0 T. Gill ... 13,749 0
 J. Youngs & Son ... 14,598 0 H. S. Watling ... 13,244 0
 C. Roper ... 14,370 0 H. C. Greengrass ... 12,034 10
 G. E. Hawes ... 14,300 0 * Accepted provisionally.

PAIGNTON.—For the erection of five dwelling houses and shops for Mr. W. Lambshead. Mr. W. G. Couldrey, architect, Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton—

Lethbridge ... £13,300 0
 Parker Bros., Newton Abbot ... 12,550 0
 C. & R. E. Drew ... 12,167 0
 H. Webber & Sons ... 12,085 0
 E. Westlake ... 11,805 10
 E. P. Bovey, Torquay ... 11,835 10
 Geo & Sons ... 11,250 0
 [Rest of Paignton]
 * Accepted.

PAIGNTON.—For erection of cottage flats for Mr. W. M. G. Singer. Mr. W. G. Couldrey, architect, Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton—

E. Westlake ... £3,126 0 C. & R. E. Drew ... £3,070
 R. Harris ... 3,106 0 H. Webber & Sons ... 2,900
 G. Webber ... 3,000
 * Accepted.

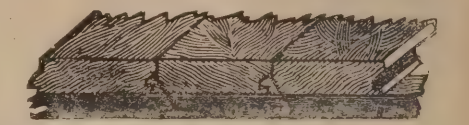
SALTBRUN-BY-SEA.—For the repair of part of Milton Street with tarred macadam, and Hilda Place and part of Milton Street with ordinary macadam, including concrete flagged footpaths, kerbing, &c., for the Saltburn-by-the-Sea Urban District Council. Mr. G. S. L. Bains, C.E., surveyor—

Hilda Place and Milton Street. ... £2,160 10 8
 J. Pearson, Normandy ... 2,089 8 9
 North of England Asphalt Company, Manchester ... 1,958 16 11
 J. R. Smiles, Limited, Middlesbrough ... 1,555 17 8
 J. Carrick, Durham ... 1,380 6 5
 J. G. Spooner, 7 Westbourne Street, Stockton-on-Tees
 * Accepted.

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17½ × 3 × 1½	6 10	6 8	9 6	



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An Architectural Causerie.Architects
and Money.

ARCHITECTURE and money-
making are clearly opposite,
and if a man's aim is toward

the latter he will not achieve it as an architect. But we are glad to think that the art of building does not set up such a sordid ideal. There is, however, a vast difference of meaning as regards money-making; there is the idea of the miser, who, among moderns, may just as appropriately be found among the "bonnes hommes" as among the more traditional regions of garret and cellar; but, be it said, money-making also includes the idea of acquiring sufficient wealth to live in comfort, among which class are counted the majority of well-known architects. The late Mr. Arthur Cates, though known as a zealous reformer of architectural education rather than as an architect, was by far the richest of his colleagues—he died worth £174,000; though of course this was not acquired in practice. Another F.R.I.B.A. who died a short time ago was also comparatively wealthy, his estate having been

proved at £40,000; but these are most marked exceptions, for one might say, speaking of successful modern English architects generally, that their possessions average about £3,000; while the average successful shop-keeper is probably five times as wealthy. Neither J. M. Brydon nor William Young were rich men; the estate of the late James Brooks was worth £4,000; and the late Mr. Bentley's has just been proved at £4,000: so that it is better to be a pork-butcher, or a man of commerce, or a professional swindler, if one wishes to die rich. Sir Christopher Wren was paid £200 a year when St. Paul's was being built, and the sum of £4 for being hoisted in a basket to the top of the dome four times a week: and things have not changed. There is still the same cry of the neglect of the architect today as there was in 1820, when "The New Builder's Magazine and Complete Library" was published, a book intended for architects, surveyors, carpenters, masons, bricklayers, &c., "as well as for every gentleman who would wish to be a competent judge of the elegant and necessary art of building," the whole forming a "complete system of architecture in all its branches, and so disposed as to render the surveyor, carpenter, bricklayer, mason, &c., equally capable to erect a cathedral, a mansion, a temple, or a rural cot." The price of materials has increased and wages have gone up, but the architect's commission still remains at 5 per cent. Of a truth genius gets little else than its own reward. The men who make the most money are generally those who have a little architectural ability and a great deal of commercial astuteness, so that the buildings they erect, though they may be as full of defects as a pod is full of peas, yet are very profitable; for it is these men who usually secure the large commercial works. But what an inheritance they leave behind them, what a collection of eyesores, what a testimony to their littleness and their mediocrity!

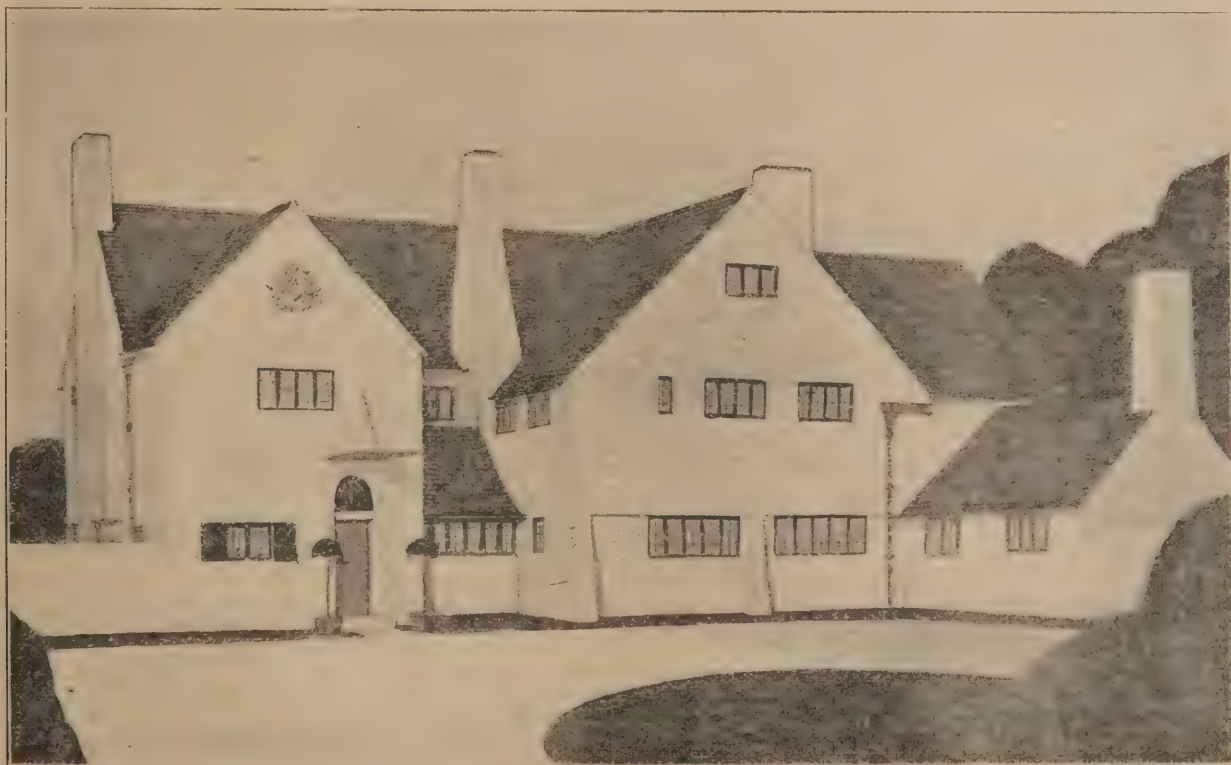
**A Curious
Proposal.**

MR. HENRY H. B. SANG again brings forward the suggestion which he made at the time of the Jubilee for illuminating the exterior of St. Paul's Cathedral as a feature of the festivities. His idea was adopted at that time by the City authorities, but only thirty searchlights were employed, whereas he states that at least fifty or eighty should be arranged on the surrounding buildings, because the lead-covered dome absorbs the light considerably, and consequently needs to be strongly illuminated. The effect of buildings brilliantly lighted at night is most pleasing

—Pall Mall, for example, is exceedingly effective when all the outside gas jets of the numerous clubs are alight, while the Glasgow Exhibition was eminently successful in this particular—and doubtless the lighting up of St. Paul's in the manner suggested would be equally imposing and satisfactory. The scheme is not a costly one, nor difficult to carry out, and we trust that the authorities will again adopt it, this time, however, employing a sufficient number of lights. Devices made up of hundreds of gas jets are expensive to maintain and very often they are not effective, especially if there is a high wind at the time; searchlights, on the contrary, are independent of the wind, and offer a new and unique scope for illumination. The dome of St. Paul's Cathedral can be seen in the daytime from considerable distances, even through the smoky atmosphere; it is grand from every point of view: and maybe it would gain in grandeur when seen at night as a beautiful object ablaze with light in the midst of a sea of black houses.

**The Widened
Strand.**

THE widening of the Strand in connection with the new street to Holborn is the most thorough and satisfactory improvement of its kind which has been carried out in London for many years past. We suffer in this country from narrow streets. Dinan is not inconvenienced by its picturesqueness, but a city like London is: an ultra-modern might even consider Fleet Street picturesque, and if narrowness be the first requirement of such beauty Fleet Street certainly possesses it in a paramount degree. But, to make use of Bacon's aphorism, streets are made to live in, not to look at: and a modern city requires wide streets. Paris was laid out as a spectacle it is true, but how admirably convenient are its streets. The great mind was at work there and it is a pity that the example is not more often followed. In every town throughout the country will be found narrow main thoroughfares which might have been wide ones if the authorities had only taken time by the forelock. Patching is futile. Fleet Street is being widened piecemeal, with little improvement. But in the Strand we at last have the grand idea—a wholesale clearance and a resulting fine vista east and west. At the present moment the roadway west of St. Clement Danes Church is a mass of wood blocks, tar, pitch, sand and other materials, with scores of men at work on them; but very soon the whole will be finished and then London will be proud of a thoroughfare of generous width.



HOUSE AT HELENSBURGH. M. H. BAILLIE SCOTT, ARCHITECT.



TOWER SCREEN, SEAL CHURCH, KENT. C. R. ASHBEE, ARCHITECT.

THE SCOTCH UNIVERSITIES AND ARCHITECTURE.

A MEETING of the Edinburgh Architectural Association was held last Wednesday, Mr. Henry F. Kerr, A.R.I.B.A., the president, occupying the chair. Mr. James Bruce, W.S., submitted the following motion: "That it be remitted to the Committee of Management to consider the provision made in the Scottish Universities for the teaching of architecture, and in the event of the Committee being satisfied that the same is inadequate, to report whether in the opinion of the Committee an application should be made to the trustees of the Carnegie Trust with a view to more adequate provision being made for such teaching." Mr. Bruce remarked that in the University of Edinburgh there were fifty-two professorships, but among them all there was not one devoted to architecture. In the Faculty of Law there were no fewer than seven professorships. When they thought of the enormous importance of architecture to the health, happiness and comfort of the people, it was really a very extraordinary thing that in the University of Edinburgh there was no such thing as a professorship of architecture. More than that, so far as he knew, in no Scottish University was there any provision made for a professorship of architecture. The Carnegie Trust had just been considering the wants of the Scottish universities. The universities had been asked to indicate where their wants lay, and although he had gone over the statements published on behalf of the university authorities, in not one of them was there even a hint that there was any lack in the matter of the teaching of architecture. Surely that was a strange position for the universities of Scotland to occupy. Accordingly he thought it would be well for a body such as the Edinburgh Architectural Association to directly press upon the Carnegie Trustees the advisability of something further being done in the matter of the teaching of architecture in the universities. He used the phrase "something further," because to some slight extent the matter was attended to in the University of Edinburgh through the Chair so well occupied by Professor Baldwin Brown, namely, the Chair of Fine Art.—Mr. G. S. Aitken seconded.—The chairman, in supporting the motion, suggested that the matter, instead of being remitted to the Committee of Management only, should be remitted

also to the Council. He read a letter from Professor Baldwin Brown, who expressed cordial agreement with Mr. Bruce's motion. Even though the Carnegie Trustees had too many claims before them to permit them to do anything in the matter immediately, it would be a good thing to put the demand for a Chair of Architecture, or some agency of the kind, distinctly before the public. The chairman added that he had seen a good deal of what was done in the teaching of architecture both in France and America, and he was perfectly confounded with the extraordinary development of the teaching of architecture in these countries. In some cases they had twenty-six or twenty-seven teachers of one kind or another in that subject alone. Why should it not bulk more largely in Scotland? The sooner they tackled the subject the better. The motion was unanimously

adopted.—Mr. Wilson Beatson afterwards read a paper, written by Mr. James Miller, I.A., on the Glasgow International Exhibition of 1901.

THE DECORATORS OF THE BOSTON LIBRARY.

PUVIS DE CHAVANNES; SARGENT; ABBEY.

IT will be recollected that a short-time ago the last of Mr. Edwin A. Abbey's paintings for the Delivery Room of the Boston Library (U.S.A.) were exhibited at the Guildhall, London. These paintings have now been placed in position, and it is therefore opportune to give a description of the decorations of which they form a part, which description we take from our esteemed contemporary, "The Architectural Review" of Boston, U.S.A.

Entering the library, the Puviss de Chavannes decorations are the first that are encountered. The entire scheme of colour in the entrance-hall, staircase and second-storey corridor is one of yellow Siena marble, rich in tone. It is conceivable that this might receive a foil in the decoration by the introduction of contrasting blues, but these should be distributed and subdivided merely as elements of contrast. The introduction of cool grey blues in low tones and large masses only tends to destroy what unity there may be in the architectural design. The wall is at once disassociated from the dado, pilasters and ceiling, and in this respect fails to be successful in the best sense of decoration. There recurs a constant desire for the tones and colouring of the Venetians which would have harmonised with the marbles. On the other hand the low-tone values, the absence of shadow, and the simplicity of composition in the Puviss de Chavannes paintings are all strongly decorative factors and are handled in a masterly manner. Whatever further criticism can be made is that there is a general insufficiency of motive or idea in most of the work. Each theme is made to cover an absurdly large area for its relative importance, and this is especially true of the wall-surfaces at the head of the staircase. There is too much of the character of a procession around a Wedgewood vase. Each figure framed within a panel might and would be decorative, but the relation of each with the next is extremely slight. This is to be regretted, as the canvases of M. de Chavannes at Amiens or at the Sorbonne in Paris have a masterly rhythm between the groups and are in each case complete compositions for the entire wall space, not isolated figures upon a sea of background.

The Sargent decorations in the long gallery upon the floor above are the very antithesis of these. Redundant in idea, showing much



HALLINGBURY PLACE, BISHOP'S STORTFORD, ESSEX: BILLIARD ROOM.
C. R. ASHBEE, ARCHITECT.

research, painted with mastery of technique, they give an impression of skill, of thought, and of ability to express that is in some respects overwhelming. The frieze of the Prophets is a masterpiece in its way; dignified, simple and with great individuality, and with thoroughly decorative ensemble; but the barrel vault and tympanum are too full, both in ideas and in motives. They are not easily decipherable, but require elaborate explanation. Forms interlock and overlap, colours and tones weave in and out until it is difficult to disentangle one motive from another. Undoubtedly this is intentional and symbolic of the confusion of religions which the decoration expresses, but it is a question whether this idea is not carried too far, and whether less elaboration and more directness of declaration would not be better decoration. The treatment at the other end of the hall is, it is said, to be much more simple.

Passing to Mr. Abbey's frieze in the Delivery Room there is found a third and equally individual conception of decorative painting. There has been much criticism in regard to this frieze in that it resembled merely illustrative work and lacked in what the painters have termed "breadth of conception." Yet it is difficult to imagine any treatment of comparatively unrelated incidents from a legend being anything else than illustrative. Whatever common impulse or motive existed that could be carried through the series has been carefully studied, but necessarily each panel is complete in itself, and the sequence of the scenes is established by the course of the narrative. This determines a consecutive number of scene-motives which are with difficulty made either symmetrical or simple in effect, however direct they may be in expression. The balance of either colour or tone values upon either side of the central axis of the room has therefore been abandoned, and in that respect leaves something to be desired; especially is this true on either side of the window; the motive on the left being naturalistic, dark in tone, with strong horizontal direction; that on the right, conventional, light in tone, and with perpendicular treatment slightly counteracted by the profusion of gold. But the chief criticism, so far as decorative effect is concerned, is this, that there is no marked dominant colour scheme or tone value throughout the series. The result is that while photographs of the frieze are full of interest, carefully considered composition, delicate sentiment and feeling, the canvases themselves are disturbed by the constant shifting of colours and tones. This is partially due to the extremely poor lighting of the room, but not wholly so. There is no doubt that this work will gain with the influence of time, while that of Puvion de Chavannes will become an uninteresting monotone.

Here then are to be seen three important decorations. One kept in harmony of tone and colour, and with a marked paucity of idea and motive; another with overwhelming diversity and confusion of motive and idea, a general tone value, and one strong theme dominant in the frieze; the third full of ideas and motives which are consecutive in their action, but without dominant tone or colour values. All three have studied composition. The first of a naïve but none the less subtle type; the second masterly in every sense, but burdened with motive; the third of a less monumental or dignified character than either of the others, but none the less gracious and attractive. Such diversity of treatment naturally induces strong personal prejudices, but it can fairly be said that no more interesting groups of decorative work have been done in the country, and that each possesses individual virtues that entirely justify the choice of the artists. That each fails to be entirely satisfactory and to reach the decorative height of the best work of the Umbrians and the Venetians is the natural outcome of the multiplicity of ideas in regard to technique, composition and a hundred other things of our day. The organized restraining influence of an established and recognized method such as the Italians possessed, which in weak men produces mannerism, in strong men eliminates minor faults. The seriousness and study with which these library decorations are painted is stimulating compared with the flippancy of much of the work which is displayed for the admiration of the public. This fact alone places them beyond much carping criticism.

Views & Reviews.

Treatment of Sewage.

This is a very useful little work by Mr. Shenton. It is a collection of notes made by a practical engineer in the course of his experience in sewerage work, and the information is given briefly and directly, and though the book is intended for the use of engineers and contractors directly engaged in sanitary work it nevertheless is written in a manner which will enable anyone to gain an insight into the methods of sewage-disposal. As a book of memoranda for quick consultation and as a reminder, it should find its way to the engineer's library, but it would have been much improved if it had been got up in a more attractive manner and been given a better cover.

"The Modern Treatment of Sewage," by H. C. H. Shenton, M.S.E., price 2s. 6d. London: S. Edgecumbe-Rogers, Offices of the Local Government Journal, 2, Dorset Street, Fleet Street, E.C.

Applied Perspective.

The author states that in writing this book he has had in mind both the everyday use and the skilled use of the art. He has therefore given in Part I. what seemed necessary to qualify the student for ordinary perspective work, and in Part II. has included a series of special problems to show what trained draughtsmen actually do, adding discussions of some more theoretical topics to smooth the way to the complicated problems that sometimes occur. A fair acquaintance with ordinary school geometry is taken for granted, but the author hopes that an intelligent and careful reader who does not know geometry may find profit in the book and learn what is fundamental in it without unreasonable effort, and instead of commencing with geometrical definitions and a few bare framework lines he shows us some reproductions of natural photographs to explain the principles. He then passes on to projection and the finding of distances and vanishing points, showing how half-distance-points are obtained when the regular distance-point is practically inaccessible through coming too far on one side. *En passant* the author points out the misuse of the word "perpendicular," which strictly means at right angles and not necessarily upright or vertical. In this connection we may remark a somewhat similar confusion of the terms "level" and "horizontal," a level line being a bent line whose component points are everywhere equidistant from the centre of the earth, and a horizontal line being a straight line whose ends are up on the same level. A somewhat unusual but very important chapter follows, on perspective scales, leading up to the perspective plan and the measurement of lines lying in any given direction, and we are then shown how to find the conjugate vanishing points and their application to ordinary cases and to inclined planes. The perspective of circles is explained in a very practical manner and illustrated by a photograph of the Chateau Chaumont. Having dealt with the principles of perspective, the author next goes on to the construction of pictures, pointing out that the effects of perspective are due to foreshortening by oblique projection on the picture plane, and that variations in this for shortening are main sources of the interest we take in the aspects of the things which we depict; some of these foreshortenings are agreeable and some are not, and though it is not possible to classify them fully we can note some of their favourable and unfavourable conditions and utilize them where suitable to our work. Those who have carefully read and studied the book so far will not be deterred by the greater complexity of Part II., especially as the opening chapter is headed "Perspective Helps," thus clearly indicating its object and scope. Some of the intervening chapters may however be passed over at the first reading in order to see what the author has to say upon perspective from elevations, which he works out in the case of a broach spire, pedestal, console and pediment. He also explains the mode of dealing with groined vaulting, finishing up with a vault with lunettes. In reading this book one is attracted by the excellence of the illustrations and by the idea all through that if the writer is not an architect he is thoroughly in sympathy with architectural aims and desires, and that what he has to say

will be more useful to the professional man than a more precise description written by a geometrician.

HENRY ADAMS.

"Applied Perspective for Architects and Painters," by William P. P. Longfellow. Boston and New York, Houghton, Mifflin & Co. The Riverside Press, Cambridge, 1901. London: Gay & Bird, 22, Bedford Street, Strand: 4to., 97 pp., price 13s. 6d.

A CRITICISM OF MODERN CITY BUILDINGS.

IN the course of a paper on London buildings which he read recently before the London Institution, Mr. C. H. Reilly, M.A., asserted there was not in England at the present moment any single serious attempt at architectural criticism. A man was allowed to defile our noblest streets with some blatant exposure of his own vulgarity or that of his architect without a word of protest being raised. Why, he asked, should it be thought necessary now for a merchant to place everything behind sheets of shining plate-glass, extending sometimes over two storeys, and cover the remainder with gilt lettering many feet in height, without any regard to the scale of the building, much less its architectural detail?

In the course of the lecture Mr. Reilly illustrated and described many of the old City buildings, and when speaking of St. Paul's described Sir William Richmond's decorations, which he contended were out of character and out of scale with the building. He afterwards passed on to a general criticism of the methods employed in the erection of modern buildings, more particularly as regards the City. First of all, he said, the sites usually belonged to different owners, and were let to various speculators, who built according to their lights; consequently in all our streets there was a maximum of irregularity and haphazard effect, as compared with a typical Paris street. He then called attention to the great blocks that are being erected in Finsbury Circus, where the two adjacent quadrants of a circle were in the hands of two separate firms of architects, with the result that the buildings were totally different. Having pointed out that the City authorities are the ground landlords of each block, he declared that one dignified scheme for the whole might very easily have been obtained. He condemned the long front of the new Salisbury House to London Wall, which for flatness and monotony could hardly, in his opinion, be equalled. The Treasury building, on the other hand, was a good example of dignified simplicity, which nowadays seemed incompatible with commercial success.

Roughly speaking, the average City building came into existence in this way: A surveyor—that is a person who knows, or professes to know, all about the value of property—sees advertised what he thinks is an eligible site. He gets the particulars together and takes them to a client of his who speculates in City buildings, and shows him what may be done with the site. The speculator agrees, and appoints the surveyor his architect, not because he necessarily knows anything about architecture as an art, but because he knows the value of ground rents. That was why all these curious buildings were put up.

Recent Work by Mr. Ashbee.—The screen for the bell ringers in the tower of Seal Church, Kent, was designed by Mr. C. R. Ashbee, M.A., and is in oak with wrought ironwork and Powell's green antique glass panels: it was executed at the Guild of Handicraft, Essex House, Bow, E. The panels in the cove are carved in relief and are coloured and gilt.—The billiard-room to Hallingbury Place, Bishop's Stortford, Essex, is on the south front of the house and is built of red bricks, with a flat lead roof. All the external timber is of oak and the ceiling of the room is constructed of large English oak beams framed together, with heraldic plaster panels, coloured and gilt: on the beams themselves are painted scrolls bearing the names of the branches of the family represented by the shields. The lower parts of the walls are panelled with sixteenth-century woodwork, and the fireplace and overmantel are also fine examples of similar date. The skylight, bay window and the wrought-iron grilles at each side were executed by the Guild of Handicraft, London, E.

ARCHITECTURE AT THE INSTITUTE OF FINE ARTS, GLASGOW.

ILLUSTRATED BY J. JEFFREY WADDELL.

THIS year the architectural works at the Institute of Fine Arts, Glasgow, are shown in the entrance gallery, which they share with some sculpture and the "black and whites." Owing to lack of wall space, some of the best drawings have been hopelessly "skied," but, considering the limitations imposed upon him, the hanger, Mr. James Miller, the well-known architect, has utilized the space at his disposal very well.

One of the best drawings in the gallery is the perspective of the proposed new Royal Infirmary by Mr. H. E. Clifford, which, it will be remembered, was the design placed first by Dr. Rowand Anderson. Both design and drawing are excellent. The same architect is also represented by a drawing of Newlands U.F. Church. An excellent drawing is also shown by Messrs. Niven & Wigglesworth, of London, of a rough-cast house at Bromley, Kent. A very fine series of photographs is shown by Mr. R. S. Lorimer, of Edinburgh. His church details—photographs of the Church of the Good Shepherd, Murrayfield—show a scholarly yet free treatment of medieval Gothic, while his house and gate lodge at Brylands, Fossoway, in the Scottish Renaissance style, are in his happiest manner. Two views are shown of Tollcross Church by Mr. W. G. Rowan; the exterior of this characteristic and quaint village church is given among the accompanying sketches. Mr. Macgregor Chalmers is represented by two views of Stepps Church (already illustrated in these columns), and Messrs. Watson & Salmon and Miller & Black are also represented by ecclesiastical work. But among the photographs shown undoubtedly the first in merit as well as in size is the splendid enlargement shown by Mr. James Miller of the Piazza and Dome of the late Glasgow Exhibition. This photograph has all the effect of a sepia drawing with the additional correctness which belongs to the camera. One is also reminded of the Exhibition by Mr. George S. Hill's views of Templeton's exhibit, a Moorish mosque-like building. A large frame of interior photographs of No. 4, University Gardens, is exhibited by Mr. John James Burnet. This work has been carried out in the architect's characteristic broad manner and well repays careful study. Mr. John A. Campbell shows two interior photographs, one of which, the Cottage Home at Drymen, is very pleasing. A block of business premises, West Nile Street, is shown by Messrs. Burnet, Boston & Carruthers, but it is not very successful. Mr. Alexander Cullen, of Hamilton, shows a very good classic design for the Middle Ward Offices at Hamilton; Mr. James A. Morris, of Ayr, exhibits three elevations of country houses in his usual somewhat

original style, drawn in brown ink and rather loudly coloured. Messrs. T. L. Watson & Mitchell's competitive elevation for the Technical College is a very good piece of design, and compares very favourably with the elevations of the accepted design, which we understand gained its place solely on the merits of its plan. This firm is also represented by a good perspective of a moderately successful frontage in Bath Street, and Mr. Mitchell by a cleverly-coloured conventional drawing of Salzburg.

While some of the work shown is very good, much is below the average of previous exhibitions, and it is to be regretted that as the authorities made up their minds to restrict the space this year they have not had the courage to return several of the exhibits. The walls have the effect of being overcrowded, and not always with works worthy of the position, the consequence being that the exhibition is not so representative of the best current architecture of Glasgow as it might have been.

Law Cases.

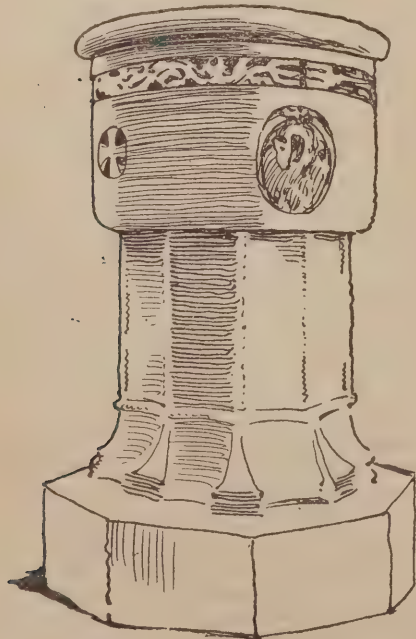
Galleries in Schoolrooms.—At the Lambeth Police Court recently a builder named Henry Young was summoned for not complying with notices of irregularity served upon him by Mr. Ellis Marsland, district surveyor for Camberwell, in connection with certain works carried out by him at the Congregational Church and Schools, East Dulwich Grove. Mr. Marsland explained that the defendant was summoned for a breach of section 80, sub-section D, of the London Building Act, which provides that "in all cases where a portion of the public is to be accommodated over or at a higher level than others of the public, a separate means of exit . . . communicating directly with the street or open space shall be provided from such floor or level." The point for the consideration of the Court was whether a new gallery which had been erected in the schoolroom was used by the public, and as such required a separate staircase as provided by the section. Mr. Marsland proceeded to say that he allowed the staircase which had been provided on the understanding conveyed to him by Mr. Cubitt, the architect, that the gallery was not intended for the use of the public. On visiting the schoolroom on December 17th he found that the services were being held there temporarily, pending the alterations to the church, and that the gallery was being used by the public. This had been discontinued, but the gallery was being used by the teachers and scholars of the Sunday school. He served a notice upon the defendant to provide a separate staircase from the gallery into the street or other open space, but that had not been complied with.—Mr. Corrie Grant (for the defendant) said the gallery was intended for use on Sunday mornings and afternoons by some of the classes of the Sunday school. Were Sunday school children the public? He submitted they were not the public in the sense in which the word was generally used.—The magistrate thought that so long as the gallery was only used for school purposes during school hours, he did not think that in the circumstances Mr. Marsland could object: he did not consider the children in the school were a portion of the public. He therefore dismissed the summons, but made an order with respect to certain gangways in the church which were not sufficiently wide to comply with the Act.

Ancient Lights.—The case of *Easton v. Isted* was recently heard in the Chancery Division of the High Court of Justice. The plaintiff was the owner and occupier of the "Golden Fleece Hotel," Commercial Road, Portsmouth, and the defendant was the owner and occupier of the adjacent premises. The action was brought in respect of the obstruction by the defendant of the access of light over a yard at the back of his premises to a window or skylight over a passage or corridor in the plaintiff's hotel. The window or skylight in question was inclined at an angle of somewhat less than 45 degs. to the plane of the horizon, and somewhat more than 45 degs. to the vertical plane. The plaintiff's complaint was in respect of a wall recently erected by the de-



TOWER OF TOWN HALL.
J. A. T. HOUSTON, ARCHITECT.

fendant along or close to the boundary line, and obstructing the access of light over the defendant's property to the window or skylight. The defendant did not admit the plaintiff's claim that the skylight in question was an ancient light. It appeared that the window or skylight in question originally formed the sloping top of a conservatory erected by the plaintiff's father in 1873 on the northern side of the hotel and abutting upon the defendant's property. This top was entirely glazed, as also was the whole of the vertical side adjoining the defendant's property above a few feet from the ground. Portions of the glazed side, amounting to less than one-half, were movable, being hung upon hinges at the top and opening outwards from the bottom, so as, when open, to overhang the defendant's property. It further appeared that at the time of the construction of the conservatory in 1873 an agreement was entered into by which the then owner of the plaintiff's property agreed to pay 1s. per year as an acknowledgment for allowing the window in his conservatory to open on to and overlook his neighbour's property, and also agreeing to close it when required to do so. The yearly payments were duly made under this agreement down to 1888, when the glass side of the conservatory was bricked up, leaving the glazed sloping top in its original position and forming the roof of what was now a corridor in the hotel. The defendant had recently erected buildings at the



FONT, CHURCH OF THE GOOD SHEPHERD,
MURRAYFIELD. R. S. LORIMER, ARCHITECT.

rear of his premises in such a position, and carried the same to such a height as to obstruct the access of light to the glazed roof of the corridor, and the plaintiff brought this action, claiming an injunction and damages. Mr. Justice Joyce, in giving judgment, said it could not be contended that the agreement was limited to the movable sashes in the northern and vertical side of the conservatory. It certainly extended and applied to the whole of the glazed portion of that side. But it was obvious that the object of the arrangement was to preclude the acquisition by the owners of the plaintiff's property of a statutory right to light over that of the defendant. It was suggested, however, that although while the arrangement continued and the annual payment of 1s. was duly made—as it was until 1888—no right was being acquired in respect of the glazed portion of the side, still such right was, during that time, being acquired in respect of the glazed portion of the sloping top, notwithstanding the existence of the arrangement and the continuance of the payment. In his Lordship's opinion it was almost impossible that this should have been intended by the parties to the arrangement, and he thought that the agreement would very well bear the construction that would effectuate what must, he thought, have been their intention. The sloping top received rays of light across, and in that sense overlooked, the defendant's property in the same manner as, though to a less degree than, the fixed portions of the side; and it was in respect of the obstruction by the defendant of those very rays of light that the action was brought. If the written agreement applied as it did to the fixed and glazed portions of the side, it equally, in his Lordship's opinion, applied to the glazed portion of the sloping top. A window was not the less a window because it was not capable of being opened, nor because it was not fixed in a vertical plane. His Lordship thought the glazed top was just as much a window as the fixed portion of the vertical side, and, inasmuch as it received light over the defendant's property, it overlooked that property in the sense in which that term was used in the agreement. The plaintiff's action therefore failed, and must be dismissed with costs.

Laying-out "New Streets": Important Case.—The case of the *Mayor of Devonport v. Tozer & Sons* was recently heard in the Chancery Division of the High Court of Justice. This was an action for an injunction to restrain the defendants from laying-out certain highways in Devonport as new streets without complying with the requirements of the by-laws of the plaintiff corporation. The case raised questions of considerable importance to local authorities. The first was whether the owners of land abutting on a highway, who had built houses on such land, fronting the roadway, could be said to be laying-out or constructing a new street, so as to bring themselves within the provisions of the local by-laws. The second question was, assuming that in such a case an offence had been committed against the by-laws, was an action for an injunction the proper remedy? In the course of his judgment Mr. Justice Joyce said that what the defendants had done and were doing was to erect certain houses upon their own land without removing the fence on either side, but making the necessary openings here and there so as to provide means of entrance to and exit from the houses that were being built. They had done nothing more than this. The land in question was triangular, one side abutting on a public highway called Ham Lane, and another on a similar highway called Tavistock Road. Now, said Mr. Justice Joyce, were the defendants laying out or constructing Ham Lane and Tavistock Road as new streets within the meaning of the by-laws? "It is clear that in the ordinary, popular and natural sense of the words they had not done so, nor ever intended to do so. In fact, it was the one thing of all others which they intended not to do. The word 'street' has various significations in different Acts of Parliament, but *prima facie* with respect to the laying-out and construction of new streets, it is limited to what is used or intended to be used as roadway; and my reasons for this view are those stated by Selborne, L.C., in *Robinson v. Barton Local Board* (L.R., 8 A.C., 798). I am unable to see how what the defendants have done or are doing is laying-out or constructing a new street or any-

thing of the kind within the meaning of the by-laws, unless there be some judicial decision which compels me so to hold. I do not think there is any such decision. In my opinion this action is misconceived and must be dismissed with costs."

No. 136, PRINCES STREET, EDINBURGH.

NO. 136, Princes Street, Edinburgh, is a new building which has just been completed for Messrs. Macvitties, Guest & Co., Ltd., bakers and confectioners. It has been in process of construction for the last two years, and has attracted a good deal of attention on account of the façade having certain novel features which are not to be seen elsewhere along the whole line of the street. Messrs. Hamilton, Paterson & Rhind were the architects. With a frontage of 30ft. to Princes Street, the building, 80ft. in height, is divided into four principal

octagonal pilasters, which rising above the whole of the floors are finished atop with carved pinnacles. Two coloured shields of Royal patrons of the establishment affixed on each side bind the granite and ashlar masonry together; and the ornamentation being all bold and the windows considerably recessed a fine play of light and shade takes place over the building under the influence of the afternoon sun. The building is L-shaped, the other front being to South Charlotte Street, where the elevation is substantially the same as that of Princes Street, though the frontage is 5ft. less in width. In the angle of the L there is a large dome with lantern, the opening to which is 25ft. from the floor. The lower panels of the dome, which is 28ft. across, are decorated with the signs of the Zodiac, the figures being in low relief. The whole of the decorations of the shop are in stencilled ornament, gold and light colours being freely used with pleasing effect. The tea-room above, 50ft. by 25ft. by 14ft. in height, is an elegant hall panelled in fine Scottish plaster-



CHURCH
TOLLCROSS

W. G. ROWAN, ARCHITECT.

floors. The walls are of sandstone ashlar, except the whole of the shop front, which has been faced with polished red Corranie granite. The feature here is a segmented arch which encloses a central doorway and two large windows, one on each side. The door is deeply recessed and its oak woodwork is carved in a light French style. There are four French casements on the first floor set in a massive arcading, each opening separated from its neighbour by a three-quarter column with an Ionic capital. The four windows on the second floor are of a plainer character, being divided by simple angle pilasters, breaking into the square at the base, with carved stops. Higher is a plain frieze, over which are the grill-room windows on the third floor. The divisions between them are pronouncedly treated with rusticated blocks, which give a feeling of strength to them as supports to the main cornice. This latter is of a plain character with modillion blocks. Above this rises an ornamental gable top having a circular window supporting a carved niche with side pillars, and overhead a broken pediment. The building is, so to speak, framed on its east and west sides by

work, with a large ceiling painting by a French artist. The smoking-room is panelled in dark oak, and has for special feature an old English fireplace with ingle-nook, the opening of the hood of which is 14ft. across by 7ft. in height. The grill-room above is fitted up to resemble an old English kitchen. It, too, is panelled in dark oak. The ceiling shows exposed joists with white plasterwork between, and the windows are filled with leaded glass of novel designs. The kitchen is on the top floor.

St. Erth Church.—The fifteenth century carved oak cradle roof in the south aisle of St. Erth Church, one of the most interesting of West Cornwall churches, has been enriched by the addition of about one hundred carved oak bosses, each different, from designs by Mr. E. Sedding. The eastern end has been converted into a morning chapel, the roof being embellished with carved panelling. All is in West-country grown oak, and the work has been carried out in its entirety by Messrs. Harry Hems & Sons, of Exeter.

THE BERLIN OVERHEAD AND UNDERGROUND RAILWAY.

An Example of Architectural Engineering.

THIS line, which has just been opened for traffic, is to many Berliners a positive eyesore. It is a long line, partly overhead, partly underground—a kind of switchback; and those parts of it that appear above ground were designed from no other point of view but that of utility and cheapness. Of course no fault may on this account be found with the engineers, Messrs. Siemens & Halske, but it was surely the concern of the public authorities of Berlin to see that the new enterprise should not be a blot on the capital of the German Empire. The "Berliner Architekturwelt" furnishes an illustrated description of the railway from the architectural point of view and introduces its article with the remark that the contractors did what seemed to them the wisest thing to do—they simply let people say what they liked. The line had to be practical and cheap. Not a bolt was to be used (more than was necessary) on behalf of the beautiful—that would have been unscientific. But as the red painted frame of the structure kept annoying the Berliners a miracle occurred. The company provided a considerable sum of money to save what could be saved in respect to beautifying the structure, and as the finished work is now presented to the eye the grumblers are more and more pacified. The covered way which the overhead line furnishes along the streets begins to impress its value on the people, and the residents find that the noise is not so great as from a common tram-line. At this point the writer of the article waxes enthusiastic and says, "I go further and maintain that he who can feel the pulse of the age and follows with open eyes our architectural development must be convinced that here, in spite of many and grievous initial faults, we have a landmark, a striking, brilliant expression of the present day. Just as in its time the project of building the town tramway brought about new and epoch-making architectural developments, so the overhead railway exhibits further progress in constructional ironwork which will doubtless be studied by the whole civilised world and pondered over."

At the starting-point of the line at the Warschauer bridge this modern art comes into æsthetic conflict with another, contributing at once the most shrieking discord. The barest matter-of-fact structure of the station of the "overhead," a work of naked but at the same time stern modern logic, comes immediately next to the bridge which exhibits the richest and most effective view of Berlin as seen from the Spree. Here is an extreme archaic art which appears to have nothing in common with the present, except as a sign of the time in so far as nine-tenths of our architects give an exterior appearance of old times to things in common use, a kind of tailor's art, forced by the fashion; but still the revered art of the theatre, that has an undeniable charm, so rich, correct and full of meaning as to make the public enthusiastic for the work of the Middle Ages; and there, on the other hand, is a picture wanting in everything that might be called art, namely, the appearance of an organism in which the discordant parts have to be got into harmony. In this last respect, consider the impression produced by the iron girders and the sandstone pillars whose traces of architectural effort make the discord still more unbearable and gives the whole structure the appearance of being temporary. The contrast will remain for all time a kind of Pasquill on the judgment of the builders. Nevertheless, says our German contemporary the germ of the future lies in that ugly structure, a fact which becomes clearer as one becomes accustomed to ironwork and its peculiar properties; and it is just in this respect that the overhead has a mission to fulfil. Frankly, buildings must in the first place rise to the position of an organism before they can pretend to aspire to the region of art.

Thus the quite undecorated stations between, like simple boxes with their stairways, are on the whole satisfactory in effect. Only when we consider the details of the supports do we become conscious of something wrong. The perspective eye marks only how much prettier

another arrangement would have looked, and seeks to be freed of the impression of a confused piece of network. To this first claim of the eye the writer of the article replies in the happy words of Richard Lucae, that an engineer must not keep in view all the individual calculations of the public along with the principal object to be attained. But even in this respect great progress has been observable during the execution of the work. At the Schlesisches Thor Station the stiff pair of supports with cross-beams and headbands where the line crosses the street near the Luther church have been converted into a simple form with a curved capital, which effectively exhibits not only its object as a support but is suited to its material. The bolt-heads and joint plates are so arranged as to form a decoration, so that utility becomes artistic—which is the art of the builder.

How much the engineer can do when he is laying his plan at the beginning is seen in the viaduct in the Bülowstrasse. Here the feeling of stiffness is done away with and confusion is avoided, while clear rhythm and pleasing outline are secured. The writer does not pretend to say that it is a model erection, but he holds it up as a genuine and a vigorous reflection of modern life. And with how little, relatively, is this impression produced. The slanted legs of the high level constitute the most genuine "æsthetic moment." They show forth the courage, lightness and airiness of the construction.

One of the most unfortunate effects has been produced by the Bellealliance bridge. Here the fine view of the street through the bridge, with its groups of figures, the two Strack Thor buildings and the view of the Bellealliance column and the Friederstrasse, were to be seen. It was evident that the broad line of the overhead would cut this view in two, and this has been done, so that the two groups on the town side of the bridge appear to be beheaded. "This awful result must, in my opinion, be rectified." Even the attention of the most unobservant is drawn to this muddle. Berlin surely cannot be content to be the butt of the scoffer; for twenty years afterwards people will only see the absurdity, and will not remember that the overhead was introduced later than these works of art. The picture will be seen and taken just as it is. Let the two groups be removed now. But a solution consonant with art might have been found. Had the form of a suspension bridge been adopted whose pillars could have risen from the landing places of the bridge, then the groups would have lent additional beauty to these pillars, and the lines of the bridge would have enhanced the beauty of the whole place and probably led the eye very pleasantly to the superstructure of the railway station. It must be admitted that this would have incurred a very heavy additional expense, and, besides, the most has been done to relieve the line of much of its illogical repulsiveness: to wit the landings and the exteriors of the pillars, which are however too highly coloured to show the static part they play.

It is to be noted, all the same, that this effect may be achieved in an apparently hopeless situation with seemingly small resources. On the Cottbuser Gate portion of the line a few of the plainest looking pillars have subsequently been furnished with decorated iron heads in modern style. The frightful looking gallows near the Hales Gates at the beginning of Gitschinerstrasse has been saved by superimposed iron decorative work; in fact it has been transformed into a notable architectural "subject." The high bridge over the canal near the Trebnerstrasse, which at present presents a most unfavourable impression, will be similarly treated. All these combinations show that the "architectural" in iron goes well with the modern trend of ornamentation. Each element will find its place, for the ornamental will keep in bounds the excess of line work in the mass of metal.

Even in the greatest problems of modern architecture the combination of iron and stone has made a most satisfactory advance in the overhead railway. The original indifference to æsthetic effect has been noticed at the beginning in respect to the Warschauer bridge station. Beginning from there, there is a steady improvement. The next unfortunate effect is at the Schlesisches Thor station, where an original

beautiful and ornamental construction in the Griebach style is cut in two by the overhead line. Here a certain effective expedient is attained by the construction of the roofing over the railway staircase in the form of open iron ways. Similar principles are followed in the small ascent at the gasworks in the Prinzenstrasse, where, with relatively small facilities, a telling and attractive solution of the problem is effected.

At the Bellealliance bridge stopping-place there is a most successful effort to harmonise the iron and stone structure where two different kinds of architecture have been thrown carelessly together. The work begins under the permanent way, and working up the steps culminates freely in front of the iron-covered way. On the whole the metal is allowed to play the chief part, and it lends to the purely practical construction a stronger appearance. The difficulties presented by the position of the stairs have been so successfully overcome that they are scarcely suspected, and the whole is carried out so effectively in point of originality of construction and general conception in all details as to merit the highest admiration, even if a certain heaviness in the composition still makes itself felt.

A quite different artistic principle obtains in the stonework westwards. Elements difficult to combine are kept quite separate. The supports only are in stone, and all on the top is ironwork. No compromise is sought after. It is a question whether this principle is artistically correct, but at any rate its effect is surprising and convincing in so far that the stations are thus like simple enlargements of the overhead viaduct, which is correct. The prevailing idea in this arrangement lies in the special exterior pillars. The introduction of the central approach under the viaduct is uncommon; the viaduct is only broken in the Blumenthalstrasse, where it changes its course by means of a beautiful support in the form of a gate; but particularly the rising curve thrown outwards, which brings into communication the opposite beds bearing the longitudinal girders at different altitudes. The line lies safe as in a cradle. It works out very fortunately having the station buildings raised above the line by means of these supports, particularly in that the profile of the station can be visibly continued in the supports below, so that the constructive work of the viaduct appears to have been forced through the opening of the horseshoe formation beneath.

Of the notable stations, that of the Schlesisches Thor is from the designs of Griebach & Dincklage; and that of the Haleschen Thor was planned by Solff & Wichards. Bruno Möhring, the creator of the happy idea of exterior stone pillars in the Bülowstrasse, has carried out the Potsdamerstrasse station. His idea has been taken up for other portions of the line.

The line runs through 10 kilometres of the most important streets of Berlin. It will connect the workmen's quarters of the east with the pleasant west, and it may be noted that the "Architektonische Rundschau," whilst the line was in progress of construction and many of its features were becoming evident, spoke of it as in many respects a thing of beauty and an additional attraction to the town. "In this railway, as in bridge-building, it is being shown that both architects and constructional iron engineers can work effectively together." The late Werner von Siemens held this railway steadily in view for a long time, says the "Illustrierte Zeitung."

A New Building Exchange.—The new Exchange premises in Sunbridge Road, Bradford, for the members of the Bradford Building Trades and Stone Exchange, has been opened.

In the Chapel of the Savoy, London, a stained-glass window has been erected to the memory of Mr. D'Oyly Carte. It was designed by Mr. E. J. Prest.

New Baths at Old Trafford.—The Stretford Urban District Council have received the sanction of the Local Government Board in respect to their enquiry for borrowing powers to the extent of £14,000 for the erection and equipment of public baths at Old Trafford, Manchester, according to the designs prepared by Mr. Ernest Woodhouse architect, 88, Morley Street, Manchester.

R. I. B. A.

INLAY AND MARQUETRY.

BY W. AUMONIER AND HEYWOOD SUMNER.

A MEETING of the Royal Institute of British Architects was held on Monday evening last at No. 9, Conduit Street, Regent Street, W., Mr. William Emerson, president, in the chair. The minutes of the previous meeting having been confirmed, Mr. Emerson announced that the Council had decided to nominate Mr. T. E. Colclutt for the Royal Gold Medal, which the King, it will be remembered, decided should not be given to the family of the late Mr. Bentley. Mr. Colclutt's name will be submitted to the King, and after approval will come up for formal election at a later meeting. The following gentlemen were then elected members of the Institute:—As Fellows, Mr. Robert Langton Cole, of London, and Mr. James Miller, of Glasgow; as Associates, Mr. Alfred Ernest Biggs (Felixstowe), Mr. Walter Watkin Ellison (Erith) and Mr. Thomas Marshall Smith.

Mr. Aumonier's Paper.

Mr. W. Aumonier then read his paper on Inlay and Marquetry. He referred first to the two methods of making inlaid wood. The one is to cut the design which is intended to be inlaid, and the ground or field, out of various sorts of veneers, all of the same thickness, fitting and fixing them together by thin paper on one face, and laying this, the open face downwards, as a whole upon a solid ground or board. This is veneered work. The other way is to cut the design out in separate pieces as above, but out of wood $\frac{1}{16}$ in. to $\frac{1}{4}$ in. thick, using the same process of marking out, and then putting the complete print of the design on to a solid ground or board, sinking holes by carvers' tools the required depth, and driving the pieces in, thus making a "solid inlay."

In speaking of "marquetry" and inlay" it was never quite understood which sort of work was indicated—whether the solid inlay or the wholly veneered work. As the workmanship of each was so distinct, he would use the term "marquetry" for veneered work and "inlay" for the solid inlay above described.

The author then dealt with the technical side of the question, describing the old-fashioned process, and that now generally employed, of marking and cutting the design in the wood, shading, &c.

Colours and Design.

In his opinion strong contrasts or too many different colours on the same panel should be avoided, except, perhaps, in the case of ivory in ebony or mother-of-pearl in rosewood. One should depend rather upon soft harmonies, such as are seen in the best examples of Louis XVI. work, with their warm soft greys and yellows, or in the golden glow of the magnificent inlay in Pisa Cathedral.

A broad effect should be striven for, to be produced by the quality and colour of the wood itself and by the direction of grain in which each piece is placed. On no account should scratching or engraving be used on the surface of the inlay, least of all to express roundness or relief in form. Dealing with a flat surface, an absolutely flat treatment should be followed. One should not aim at too great fineness, or intricacies and complications of lines in the design. It is useless to try to emulate the painter and attempt to make too much of a picture—the material is against it.

Difference of the Two Methods.

The author went on to speak of the difference between the quality of marquetry and inlay, taking the words to bear the meaning above attached to them. "Marquetry," being wholly the work of the saw, is apt to become a little too soft and undulating, and perhaps a little bit flabby in parts, under the influence of that more or less mechanical instrument; while "inlay," being partly the saw's work, and, in part, the work of carvers' tools—cutting in and working by hand—is capable of receiving a stronger, more vigorous treatment of outline, and is therefore likely to reach an individual

and lifelike character of form unattained by the saw alone, which stamps it as finer work—from an art point of view; and even the occasional inaccuracies of fitting, and consequent different thicknesses of joints here and there, give it a distinct charm of its own. It also has a more pleasing quality of surface, especially as, in course of time, the inlay, being thinner, shrinks more than the solid ground, and thus becomes a little lower than the general surface, making a delightful play on the face of the work.

Solid inlay, with the inlay left in relief and afterwards carved, the author strongly condemned. Carving—as carving—is not improved by having its ground made of a different colour from itself. Inlay—as inlay—is not helped by having its surface frittered away by the undulations of carving. In conclusion, he urged them to sweep away all scratchy, uncharacteristic work, and get back to the face of Nature for inspiration in this as in other arts.

Mr. Heywood Sumner's Lecture

dealt with the simplest form of inlay in wood, namely, coloured wax stoppings, a form of inlay which has fallen into neglect. The Victoria and Albert Museum has some very fine specimens of old work of this kind. The effect is produced by incised lines, sunk spaces and dots, all filled in flush with green and red wax. Though, after the lapse of 550 years, some of the stopping has perished, yet the beauty of design yielded by the firm incisions remains, and these old examples show what fine things can be done in this method by artists who understand the graphic possibilities and the limitations of flat-surface decoration.

The Method Employed.

Mr. Sumner went on to describe the method he had employed in some experiments of his own in this kind of work. First trace the design on the panel of wood to be incised; cut it either with a V-tool or knife-blade fixed in a tool-handle; clear out the larger spaces with a small gouge, leaving tool-mark roughness in the bottoms for key; when cut, stop the suction of the wood by several coats of white hard polish. For coloured stoppings, resin (as white as can be got), beeswax and powder distemper are the three things needful.

Application of the Wax.

The melted wax may be run into the incisions by means of a small funnel with handle and gas-jet affixed; it is attachable to the nearest gas-burner by india-rubber tubing, so that a regulated heat can be applied to the funnel. When thus attached and heated, pieces of wax of the required inlay colour are dropped into the funnel, and soon there will be a run of melted wax dropping from the end of the funnel-spout, which is easily guided by means of the wooden handle, and thus the entire panel may be inlaid with the melted wax. Superfluous surface wax is cleared off with a broad chisel so as to make the whole surface flush.

The Suction of the Wood is Stopped

by means of white hard polish, otherwise the hot wax will enter the grain of the wood and stain it. Incised panels may be filled successfully with japanners' gold size and powdered distemper colour, using a palette knife to distribute the slab mixture. The melted wax, however, gives a more interesting and accidental result, and is better suited for designs that depend on spaces of colour-stopping for their effect. A close grain is the one thing needful in the wood. As to design, that which is best suited may be compared to a broad sort of engraving. Within certain limits, the manner of design is more free than is the case with inlay composed of veneers of hard material. The absence of beauty of material—e.g., pearl, ivory or choice woods—must be forgotten in the beauty, fancy and austere freedom with which the incised decoration is expressed.

A short discussion followed. Mr. J. D. Crace proposed a vote of thanks and referred to a somewhat similar method of inlay to that in wax described by Mr. Sumner in which a composition of glue, whiting and linseed oil was used as a kind of gesso.

Mr. Butler Wilson in seconding the vote spoke of inlay with marbles and metals. Mr. Emerson was surprised the inlay of the East—of India,

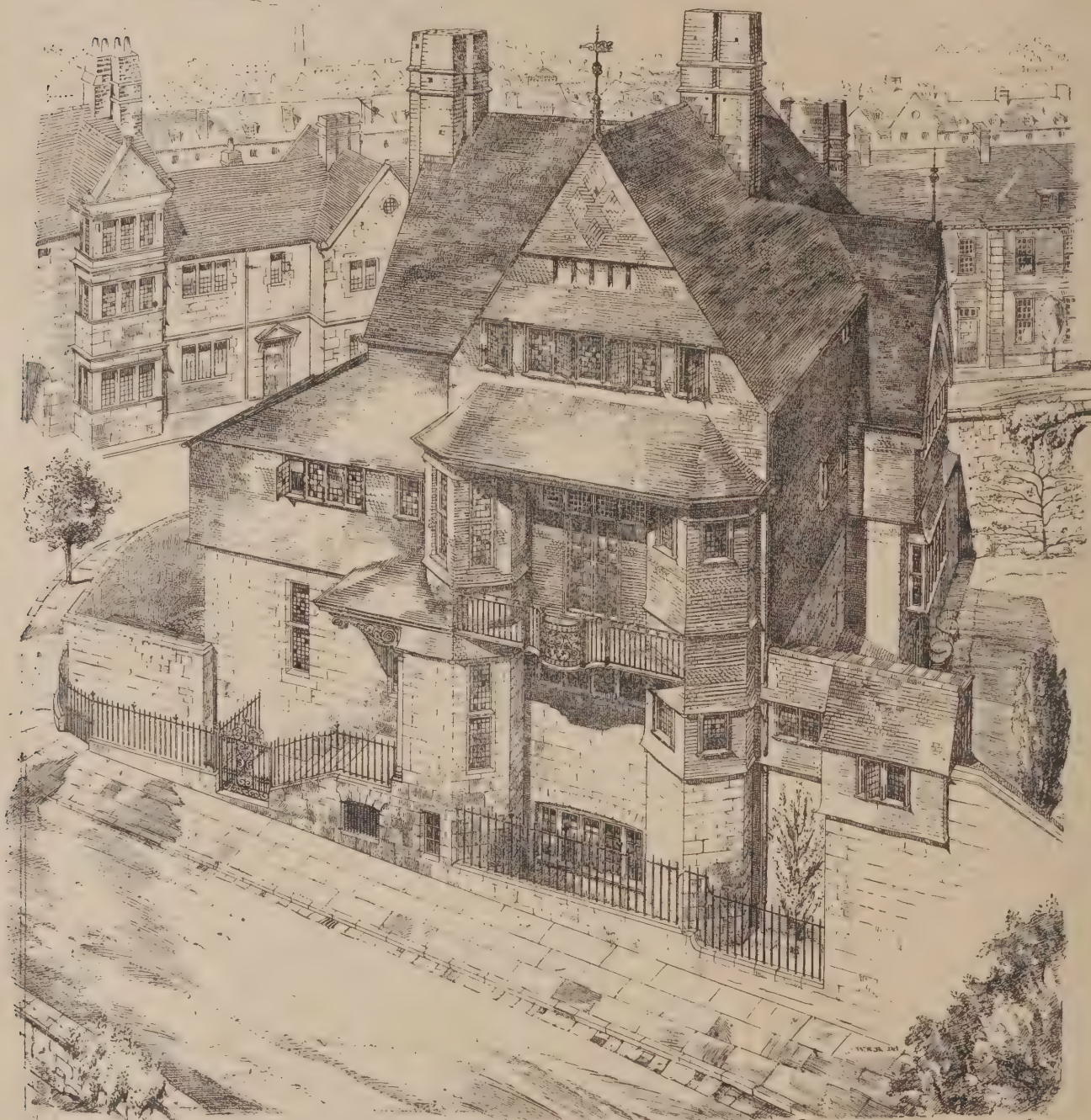
Egypt and Persia—was not mentioned, for he thought perhaps the finest examples were to be found there. The meeting then terminated.

ARCHITECTURE AND ART IN RUSSIA.

THE introduction of art into Russia was contemporaneous with the introduction and acceptance of the Christian religion. The first artistic activity was seen in the building and beautifying of churches. Russia's first teachers in the art of building were the Greeks, but in the north of Russia German artists predominated. Of the old monuments of building art which have been preserved up to the present time, the following are the principal:—The Kiev and Novgorod Cathedrals, founded in the eleventh century and built on the model of Sta. Sophia of Constantinople. Then follow the two cathedral churches in Vladimir—the Uspenia Bogoroditzi, built by Andrew the Pious; the other, St. Dmitri, built by Vsevolod III. These churches were built of white stone brought by water from Kamskoj, Bulgaria. On their outside walls is a reddish circle made of small half-columns. From the monuments of the founder's art we take the Korsun gate of the Novgorod Sophia Cathedral, made by German workmen in bronze. In the Sta. Sophia Cathedral at Kiev there remain still remarkable mosaics and frescoes done by Greek artists. From the twelfth century Russian historians begin to make note of Russian architects and image-makers. Thus a writer remarks of the renewal of the Susdalsk Church (1194) as an exceptional case, as the restoration of the church had been done by Russian hands and without the aid of Germans. As regards Russian domestic architecture, the houses were simple, small and poorly decorated within. They were of wood, and were divided into compartments, the one for sleeping and the other for eating. A wall separated the two rooms, covered by an awning stretched over pillars. Similar primitive simplicity reigns even yet amongst the peasants' homes. A corresponding simplicity is observable in the domestic utensils, the tables and benches being roughly made. The houses of the upper classes were distinguished also by great simplicity without, though decorated within. Being built of wood the towns were subjected to the risk of destructive fires and consequently few specimens remain of the old Russian architecture.—(Translated from Ilovaiski's "History of Russia.")

Sir John F. D. Donnelly, K.C.B., R.E., died on Saturday at the age of sixty-seven. He was an inspector for science from 1859 till 1874, director of science from 1874 till 1881, and from 1881 till 1884 assistant secretary of the Science and Art Department, South Kensington. In the latter year he was appointed secretary and permanent head of the department, and for the next fifteen years the direction and control of the Science and Art Museums at South Kensington were in his hands. He retired in 1889, when he was succeeded by Sir George Kekewich.

Architecture and Natural Scenery: The late Mr. Rhodes's Aims.—Mr. Herbert Baker, F.R.I.B.A., the architect of the new cathedral to be erected in Cape Town, speaks of the ennobling influence of natural scenery which was present in the mind of the late Mr. Rhodes in connection with every site he chose and every building he contemplated: such as a cottage he built, where poets or artists could live and look across to the blue mountain distance; a university, where young men could be surrounded with the best of nature and of art; a lion-house, a feature of which was to have been a long open colonnade, when the people could at once see the king of beasts and the lordliest of mountains; the Kimberley "Bath," with its white marble colonnades embedded in a green oasis of orange grove and vine trellis, looking to the north over illimitable desert. Such things would perhaps occur to most men, but with him they were a passion—almost a religion. He took pleasure in having the metal-work of his houses; hand-made by local craftsmen, and he started a tile manufactory near Cape Town for the main purpose of killing corrugated iron.



ALL SAINTS' VICARAGE, PLYMOUTH. THE LATE J. D. SEDDING, ARCHITECT.

DELAVAL CHURCH.

THE eight hundredth anniversary of the famous Lady Chapel in the grounds of Seaton Delaval Hall, Delaval (now the parish church of Delaval), was commemorated recently. The church is considered to be the only vestige now remaining of the original castle of the Delavals, and it is one of the purest and most perfect specimens of Norman architecture. The roof is the only part which has undergone any alteration. The Delavals remained true to the old faith until the close of the seventeenth century; and though their religion was proscribed, and the utmost penalties enacted against recusants, they maintained a chaplain to administer the rites of the Catholic Church to the scattered members of the flock. The exact date

of the dedication of the church is not certain; but the double row of zig-zag ornamentation on its two lofty Norman arches and the plain heavy capitals of its sturdy pillars fix the date of its erection at the end of the eleventh century, probably about 1090. With the exception of the rebuilding of the chancel wall in the fourteenth century, there has been no structural alteration. The two most interesting pieces of antiquity within the walls of the church are undoubtedly the recumbent effigies of a knight and his lady, supposed to be those of the founders Hubert De La Val and his lady, Richolda. The knight's chain armour, helmet and shield are all peculiar to the eleventh century, while the drapery of the lady is also distinctive of the same period. In 1892 the effigies were removed from the corners at the west end of the nave to the chancel within the

altar-rails. The church has been built on the typical Norman plan of nave, choir and chancel. Originally there had been two entrances, but now the western door only remains. This door has a sculptured tympanum, and a small zigzag indented label mould round it. High up in the wall above the doorway is a latticed window which leads to the belfry, in which originally there were two bells, but only one remains, which is believed to be a pre-Reformation bell, although there is no ornamentation on it. The window and the three armorial shields below it are protected from the weight of the high-pitched gable by a small arch. Inside the doorway are five shields of the same size and pattern. These shields each bear coats-of-arms, and are said to be the earliest we have in preservation in Europe. The windows are all modern. In the stonework round the small windows above the old doorway

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THE NEW OVERHEAD RAILWAY IN BERLIN. BRUNO MÖHRING, Architect.

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"INK-PHOTO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

HOUSES, DERBY ROAD, NOTTINGHAM. BREWILL AND BAILY, Architects.



"INK-PHOTO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

BRANCH BANK AT HIGH BARNET FOR BARCLAY & COMPANY.
ARTHUR C. BLOMFIELD, F.R.I.B.A., Architect.

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AVENUE UNDER THE NEW OVERHEAD RAILWAY IN BERLIN. Professor A. GRENANDER, Architect.

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is a portion of pre-Norman interlaced knot-work; time and exposure have almost obliterated the marking. On the north side of the choir are traces of either a doorway or a low window. High up on the north wall of the nave is an ancient Saxon window, now built up, which is of the greatest interest, from being one of the very few that are now to be found in England. For about 800 years it was the private chapel of the Delaval family. In 1891 it was presented by Lord Hastings to the people as the Delaval Parish Church.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Efflorescence on Brickwork.

BOLTON.—C. T. J. writes: "What is the cause of the white coating which appears after a time on new brickwork?"

See an answer to an enquiry about white efflorescence on brickwork on p. 451 of our issue for February 12th last.

Cubing a Building.

HOVE.—R. writes: "Which is the usual method of taking the superficial area of floor space and also the cubical contents of a house?"

The superficial area of floor space is found by taking the measurements of each room separately from wall to wall, squaring, and adding together. The walls are not taken account of. Measurement of a building "per square" for rough pricing is, however, obtained by taking the dimensions from out to out of the walls at the ground level, so as to include any projection of the plinth or other set-off. The cubical contents of a building are usually found by taking the dimensions from out to out of walls and from half the depth of footings to half-way up the roof.

Architecture and Surveying.

HASTE writes: "I have a smattering of both architecture and surveying, and am a fair draughtsman. (1) Which profession do you consider advisable for me? I am too old for a longer apprenticeship than two, or at the very most, three years? (2) Is there as much to learn in surveying as in architecture? (3) Is it usual to be apprenticed to surveying? (4) Are there many offices where surveying only is done, or is it usually coupled with architecture or civil engineering?"

(1) We think you would have perhaps a wider opening in the architectural profession, but both professions are crowded, and unless you have considerable attainments you are not likely to succeed. The building trade will, we think, offer the greatest chance, and the little smattering of professional subjects would be found very useful. (2) No. (3) Yes; the general term is three years. (4) A practice in surveying alone large enough to be remunerative is difficult to get, and a surveyor usually engages also in the businesses of estate agent, quantity surveyor, architect or civil engineer.

Libraries, Baths and Washhouses.

SWANSEA.—H. writes: "(1) What would be an approximate price per ft. cube of a library and baths combined, say, for a village? (2) How are public washhouses arranged?"

(1) 11d. or 1s. per ft. cube. (2) See R. O. Allsop's book on "Public Baths and Washhouses" (B. T. Batsford, price 5s.).

Agreement between Builder and Building Owner.

EASTON.—G. D. writes: "Kindly give a few particulars about preparing an agreement between builder and building owner."

See the section "General Conditions" in "Specification, No. 5."

Architectural Formulae.

MANCHESTER.—J. S. W. writes: "What are the best formulae to commit to memory, for examination purposes, in order to calculate the strengths of the columns, girders, &c.?"

See Hurst's "Architectural Surveyors' Handbook" (E. & F. N. Spon, Ltd.).

Engineering Notes.

The Works in connection with the Whitechapel and Bow Railway have been so far completed that last week ballast trains were able to travel from end to end of the line.

The Haverigg School, Millom, has been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with Shorland's patent Manchester stoves, exhaust roof ventilators and special inlet tubes.

Electric Trams in Manchester.—During the last few months rapid progress has been made by the Tramways Committee of the Manchester Corporation with the work of preparing for the gradual extension of the electric tramcar service. The next route to be opened for electric traction will be that from the Town Hall along Princess Street and Upper Brook Street to High Street, upon which horse cars are now running. The overhead system has been adopted.

The New Station at Newmarket of the Great Eastern Railway Company, which is a quarter of a mile nearer the racecourse than the old one, was opened last week. The new station, which has cost nearly £10,000, has a platform nearly a quarter of a mile long on each side of the rails, and also a dock at the Bury end. The premises will be lighted by electricity. The principal approach to the station is by the new road from the High Street. From this road, which is on the west side of the Jockey Club premises, a residential block of buildings has been erected for the King's use. At the Grand and July Stands, on the Heath, fresh Royal accommodation has been provided for his Majesty.

The Great Reservoirs between Ashford and Staines, whence it is understood three of the Metropolitan companies—the Grand Junction, West Middlesex and New River—are to be supplied with additional water taken from the Thames above Staines Bridges, are now much advanced. After running from the intake for a mile or so along the aqueduct to the powerful pumping station near the London Road, Staines, the water will be forced into the storage reservoir, and pass thence as required to the filtering beds at Hampton, lower down the river. The works, which are being carried out by Messrs. J. Aird & Co., are of an extensive character, and have already occupied several years in construction.

Mr. William A. Valon, J.P., M.I.C.E., has resigned his position as engineer of the Ramsgate Gas and Water Undertakings, in consequence of his consulting and Parliamentary practice becoming so large as to require the whole of his time. Under Mr. Valon's guidance the Ramsgate Gas and Waterworks have achieved great success, financially and otherwise. He first introduced a constant water-supply, and during his management nearly all the water mains have been relaid. He was the first to adopt the prepayment-meter system of gas supply and he was responsible for connecting the East and West Cliffs by new roads.

Builders' Notes.

The Aberdeen Master Masons' Association held its annual dinner recently. Mr. Robert Slessor presided.

Mr. Clement Wallworth, builder and contractor, of Gorton, died last week at the age of fifty-three years.

A Misquotation.—A firm of Blackpool builders recently quoted 3s. per yard for brickwork upon the supposition that the yards were to be measured superficially instead of cubically. The Blackpool Council decided they should pay for the mistake, though a feeling was expressed that the ratepayers might stand in to the extent of half the difference. As a result the Blackpool people have got a cheap chimney at their electricity works.

Mr. James Gordon, manager of the Aberdeen Building Co., Ltd., died last week. He was born at Cullen in 1838. Mr. Gordon went to Aberdeen about forty years ago as foreman to Messrs. Smith, shipbuilders. He remained in the capacity of foreman for ten years, and afterwards for a short time carried on business as a building contractor on his own account. Subsequently he was appointed manager of the Aberdeen Building Company, a position which he held for sixteen years down to the time of his death.

The Farnworth and Widnes Brick and Tile Company has opened new works at Farnworth. The company was started with a capital of £10,000, and the works have now been completed. The land on which the works are situated consists of 13½ acres and contains a valuable bed of clay, sufficient to last fifty years. The site is alongside Farnworth Station, on the London and North-Western Railway, and a siding has been made into the company's works. The machinery is of the most modern type for the most economical production of bricks and tiles, and an output of 25,000 bricks per day has been guaranteed. There are three kilns, one being of considerable dimensions, and there is also a drying shed 112ft. by 110ft., and capable of holding 120,000 bricks. The arrangements have been carried out by Mr. J. Buchanan, M.I.M.E., consulting engineer, of Liverpool.

Collapse of a Building.—Some new business premises which were being erected in the centre of High Street, Barnstaple, for Mr. J. T. White, as a warehouse, collapsed recently. The building was three storeys high and was of red brick, with limestone dressings. The front and walls were finished, the roof was on, and much of the interior work was done. The collapse was complete, nothing remaining but a heap of debris, some of which scattered over the road and smashed the plate-glass windows of the shop opposite and the smaller window of an adjoining house. The scaffolding was still standing. The collapse is attributed to the giving way of one of the pillars built of brick, faced with limestone, bearing an iron girder over the shop front which carried the weight of the greater portion of the building. The damage is estimated at £600. The contractors are Woolway Brothers, who are also building the new Barnstaple Post-Office. The original architect was Mr. F. W. Petter, but Mr. Nash has recently acted in that capacity.

All Saints' Vicarage, Plymouth.—The planning of this vicarage by the late J. D. Sedding is suggestive and interesting, while the treatment of the exterior is distinctive of the man, being full of that vigorousness and thoroughness which Sedding displayed in all his works.



BASEMENT PLAN.



GROUND-FLOOR PLAN.

ALL SAINTS' VICARAGE, PLYMOUTH.

Bricks and Mortar.

APHORISM FOR THE WEEK.

*But see, a noble shelter here,
This grand arcade where our Venetian
Has formed of Gothic and of Grecian
A combination strange, but striking,
And singularly to my liking!*
CLOUGH ("Dipsychus.")

Our Plates. THE branch bank at High Barnet is a red brick and Portland stone building. It was built in 1897 for Messrs. Barclay & Co., Ltd. It was designed by Mr. Arthur C. Blomfield, M.A., F.R.I.B.A., Messrs. Dove Brothers being the builders.—The houses in Derby Road, Nottingham, were erected for Mr. Leonard Tideswell. The site was a very awkward one, and the houses had to be set forward one in front of the other, owing to the limited space. The buildings are of red sand bricks, and are covered with green slates, all the woodwork being painted white. Unfortunately the buildings are somewhat marred by the ugly finish of the boundary walls which Messrs. Brewill & Baily's client erected.—The illustrations of the new overhead railway in Berlin illustrate the article on p. 116 of this issue.

Honours for an English Architect Abroad. CAVALIERE WILLIAM SCOTT, of Bordighera (R.I.B.A. Medallist and Travelling Student, 1877), who recently received the decoration of the Crown of Italy, has been unanimously elected an Honorary Associate (Accademico d'Onore) of the Royal Academy of Fine Arts of Venice (Regia Accademia di Belle Arte in Venezia), the diploma being accompanied by a gracefully-worded letter of appreciation and esteem.

Grey Friars Church, Newgate. A MEETING of the Royal Archaeological Institute was held recently, when Mr. E. B. S. Shepherd read a paper on "The Church of the Grey Friars at Newgate," where this Order had a home for nearly three hundred years, when their Foundation was turned to educational uses by King Edward VI., who founded Christ's Hospital. The Friars came to England in 1234; four made their way to London, and acquired a house in Cornhill. Soon after, land was given them near Newgate Street, and they built a church, which was replaced by Queen Margaret's Church in 1306. This had fifteen windows on each side, and three at each end; it was 300ft. long by 89ft. wide and 64ft. high. It was ceiled in 1420 at a cost of 200 marks, and the pavement was of marble. The chief authority for the history of the Foundation was a manuscript in the Cottonian Library, of which more use had been made for genealogical purposes than to discover the architectural features of the old church. Mr. Shepherd referred to diagrams showing the ground-plan—the choir separated by a narrow passage from the nave, and compared it with the church of the Black Friars at Norwich. The Cottonian manuscript contained a list of burials, and on another plan the position of the stones in the church was laid down. The church was probably not vaulted, nor had it originally a clearstory. One was shown in some old drawings, but, if these were correct, the clearstory must have been added at a later date. The church had a tower, not improbably like that of the Greyfriars at Lynn, but no trace of it remained.

A Wickerwork Scaffold. THE Parish Church of St. Mary, Islington, which has for some time shown signs of decay, is now reported to be in an unsafe condition. It is therefore to be pulled down and entirely rebuilt. The original parish church of Islington was built about 1483. In 1751 it became dilapidated and was demolished, the present building being then erected at a cost of £7,340. It was found necessary in 1787 to strengthen the tower, and the following interesting account of the work is given by Nelson: "Thomas Birch, a basket-maker, undertook, for the sum of £20, to erect a scaffold of wickerwork round the spire, which he formed entirely of willow, hazel and other sticks. It had a flight of stairs within, ascending in a spiral line from the octagonal

balustrade to the vane, by which the ascent was as easy and safe as the stairs of a dwelling-house. This ingenious contrivance entirely superseded the use of a scaffold, which would have been more expensive, and is frequently attended with danger in works of this kind. The spire on this occasion presented a very curious appearance, being entirely enveloped, as it were, in a huge basket, within which the workmen were performing the necessary repairs in perfect safety."

Victoria Station to be Enlarged. HOUSES on the east side of Buckingham Palace Road, adjoining Victoria Station, are now being demolished to make way for enlargements. The railway company has acquired the whole of the property on that side of the road from the Grosvenor Hotel to within a few yards of Ebury Bridge, and the side wall of the station will in future form that side of the thoroughfare. This will add about eight acres to the station space, provide platform accommodation for eighteen trains, against eight at present, and enable four lines to run right into the station. To begin with the open space in front of the station, this will be increased by nearly half its present area, the front of the station being set back so as to be flush with the front of the Grosvenor Hotel. The space will also be relieved of cab traffic, as entrances and exits will be provided in the Buckingham Palace Road. Facing this open space, and having a common frontage with the hotel, will be the company's booking and other offices, on a site 240ft. by 55ft. The floors above the offices will form an extension of the hotel, which is the property of the railway and let to the Gordon Hotels Company. Passing through the booking hall, the visitor will come to an open "circulating space" 240ft. wide—the full width of the station—and 100ft. deep. Then beyond this will be the platform gates, and the platforms will extend under Eccleston Bridge and as far as Elizabeth Bridge. Both these bridges will be raised to give greater headway beneath, and in order that the gradients may not suffer Buckingham Palace Road will be gradually raised towards the approach to each bridge, where it will be 5ft. above its present level. Cabs will enter the station to take passengers at Elizabeth Bridge, leaving the station at a point nearer the Grosvenor Hotel. This great extension of the station will cost about a million sterling, and will form part of the scheme for widening and improving the line from London to Brighton which is at present being carried out.

Norman Frescoes Discovered. AN archaeological find of considerable interest has been made during the preliminary work in connection with the restoration of Claverley Church. Claverley is a little village close to the ancient town of Bridgnorth, which, in turn, is about 14 miles from Wolverhampton. The church is a queer plastered edifice, with a carved oak three-decker pulpit, oak pews and private chapels on each side of the nave belonging to the Gatacre family, and containing curious brasses and alabaster tombs. During the past few weeks a body of workmen have been employed clearing out the interior and stripping the walls. The pews, pulpit and other objects have been carefully taken down, the walls bared to the stonework, galleries removed and the floor taken up. The work has resulted in several discoveries. The most interesting of the discoveries is a Norman fresco, or mural painting. Down one side of the nave run three Norman arches, which are generally considered the oldest portion of the church. The tops of these have been hidden by the gallery which was put in front of them, and the fine pillars have been badly hacked to make supports for the joists. The fresco runs along the top of the arches, just where it might have been expected from similar works brought to light in other churches. Unfortunately, it has been irretrievably ruined. At the Reformation, or before, exception seems to have been taken to the crude pictures, and they were whitewashed over, and huge shields and other devices painted on. These, in turn, have been coloured, plastered and otherwise hidden, and other inscriptions put on. So the process has gone on, until now it is impossible to get the mass off without damaging the Norman work, and it can only

be brought faintly to light in patches. It is identical in treatment and general idea with the famous Bayeux tapestry.

Dover's Roman Pharos. THE Roman pharos which adjoins the ancient church of St. Mary in the Castle, stated to be the oldest church in England, was constructed about 43 A.D. There were originally two of these beacons: one on the western heights and one at the Castle—that is to say, one on either side of the valley, which, in olden times, formed the banks of an inlet which flowed from the sea. The pharos on the western side of the town has long since disappeared, nothing remaining except its foundations, but the pharos at Dover Castle is in a fair state of preservation. The structure is built of Roman bricks and mortar, and historians believe that the tiles were probably brought from abroad. The pharos is octagonal on the exterior. The interior of the building, however, is square, each side measuring about 14ft. The thickness of the walls in the lower part is 10ft. It is impossible to say how high the pharos was originally, but it is represented as having had five storeys. The present height is about 40ft. It was discovered by excavation that the building was originally connected with the church by an underground passage. At the present time the Royal Engineers are roofing in the tower with a view to preserving it from the effects of the weather.

Stained Glass and the Artist. MR. REGINALD HALLWARD has completed a new stained-glass window for St. Etheldreda's, Fulham. It is almost the first instance since the sixteenth century of a window in which every process has been carried out by the artist himself. True, in the early days of the Oxford Movement one or two enthusiasts established their own kilns, but these were amateurs, influenced by the right spirit but without the necessary technical training. The leading and the firing is usually done at a factory, the result being that the leading bears the same relation to the work of the artist's own hand as an engraved copy-book heading bears to a well-written but characteristic signature. The lead is of uniform thickness, perfect in its lines and curves, and absolutely expressionless. On the other hand, when the artist personally does the leading, whether he uses it for outlining or to enforce effects by contrast and opposition, or to give depth and richness to a piece of decorative colouring, he controls the form and thickness of the lead at every point. That the artist himself should fire the glass in his own kiln is quite as important; the artist who drew the picture should be able to control the process so as to give the best effect to every piece. Mr. Hallward's window at St. Etheldreda's consist of two, out of a series of sixteen, pictures he is making to illustrate the life of the patron saint.

A Submarine Archaeological Survey. THE British Consul at Naples remarks in his report for the past year that it is strange that, in spite of all the interest taken in Southern Italy, and especially near Naples, in archaeology and exploration, no definite chart has ever been made of the important Roman remains beneath the sea, which stretch almost without interruption from Naples to Baia. It has been left to the British Association to undertake this, and under their auspices Mr. T. R. Günther, of Magdalen College, Oxford, has been engaged for some months in making a detailed survey of the Roman structures beneath the sea, from which it would appear that the sea-level has risen about 20ft. since those days, and has covered many villas and piers, and probably also a road, which seems to have existed along the coast of Posilipo. Mr. Günther's survey, says Mr. Neville Rolfe, will be of great practical value, apart from its scientific interest, because many boats run upon those old foundations annually.

The New War Office. when finished, will contain about 400,000 cub. ft. of worked Portland stone and 4,000 tons of steel (all English); while no fewer than 25,000,000 bricks will have been utilised. Messrs. Foster & Dicksee, of Rugby, are the contractors.

THE PREVENTION OF DAMP IN WALLS FROM EXTERNAL CAUSES.*

By JAMES MCLEOD.

THE question of excluding damp from walls is one of admitted importance: a dry house is a healthy house, a damp one nothing less than a dangerous dwelling, for damp is one of the most prolific and most generally acknowledged sources of disease. A damp wall checks the passage of air through its pores, is cold, and the evaporation from it lowers the interior temperature of the building, and consequently occasions a rapid radiation of heat from persons dwelling within its influence. This combination of damp and cold renders the building most unhealthy, and its inhabitants are liable to colds of every kind. Besides being so unhealthy, damp walls are uneconomical, by reason of the great absorption of heat by the evaporation of the moisture from their surface, and the consequent increased consumption of fuel required to keep the interior of the building warm. Dampness also causes an early decay in the materials used for the construction of the building. The decay of stone or brick is almost invariably the result of damp, either by its own action—by the freezing of the water in the walls—or by the acids which are conveyed into the stone by the moisture. The damp in masonry also communicates itself to the woodwork, and causes rot throughout the building. It also causes the discolouring of the plaster and painter-work, spoils the interior furnishings, has a most destructive influence on books, and altogether renders the building most unwholesome.

These matters are of no moment to the man who builds to sell and cares not how soon his work goes to pieces, but they are of the greatest importance to the occupier, who wishes a healthy home.

With the good building material which we have at our disposal in this district damp is an evil which we never reckon on in our work, and one which should give us little or no trouble, provided good material is put into the work and the workmanship is properly done. The materials in common use with us are stone, brick, timber and, occasionally, concrete.

Stone and brick are chiefly used, and these I shall deal with mostly; concrete is employed in places where those other materials are not easily obtainable, or for special purposes. Timber is only used for temporary structures, and need not be considered by us.

The treatment of stone and brick walls for the exclusion of damp is in most cases similar.

Causes of Damp.

The walls of a new building are always damp. The quantity of water which is conveyed into a wall in the process of building is very great. Suppose, for instance, that 100,000 bricks are used in the construction of a wall, each weighing 7lbs. Even a good brick can suck up from 10 to 20 per cent. of its weight in water, but let us assume 10 per cent. as what gets into it by the manipulations of the bricklayers; also assume that the same amount of water is contained in the mortar, a quantity much understated. The mortar forms one-fifth of the wall; thus nearly 100,000lbs. of water, equal to about 10,000 gals., may be assumed to be put into the wall in the process of building.

The absorbing power of good sandstone is little less than that of brickwork; most limestones are very porous; Portland stone is said to be capable of absorbing 14 per cent. of its weight, and Bath stones as much as 17 per cent. This does not allow for the water in the plaster and other work, and can be taken as a fairly moderate estimate; and this moisture must be removed before the house is habitable. This is effected by firing the house, which should on no account be occupied till this is done, as the operation causes the air to become saturated with the moisture drawn from the wall; rendering it most unhealthy. A thorough draught of air greatly assists the drying of the interior of the building.

When walls have thus been freed from this

initial damp it is their proper function to prevent water again entering from the outside, but as the external surface of the wall is always exposed to the elements, and as all building materials are more or less porous, the rain driven against the wall will penetrate into it. The water thus communicated to the wall is partly evaporated out again by the action of the sun and air and partly drawn through it by a capillary attraction, and if the material is very porous or the wall very thin this may saturate it. This is the chief cause of damp. It is not necessary, however, that it rain to convey damp to a wall. In the atmosphere itself there is always a certain amount of moisture, which varies with every degree of temperature; the amount increases as the temperature of the air rises. When the proportion of water in the air is greater than it can dissolve or hold, the atmosphere is said to be damp, but when the air can dissolve all the water it is called dry, notwithstanding that it still contains water.

During the heat of a warm day the atmosphere may be clear and apparently dry, although it really contains as much water as it is capable of dissolving at that temperature. Whenever the air is cooled, as for instance at night, it becomes unable to hold as much water as it did in the heat of the day, so that some of the water is discharged and becomes dew, mist, and even rain, according to the degree and rapidity of the cooling process; and as all bricks, stone and similar materials are capable of absorbing this moisture from the air it is easily seen that it is possible for a wall built of very absorbent materials to be always damp, even in an atmosphere which seems to be dry.

One of the chief evils of this saturation of the wall is to cause decay in the material used.

Some of the water which has been deposited in the stone (or brick) is again drawn from it when the temperature rises. This causes a constant flow of moisture in and out of the stone, which gradually loosens the particles and allows the stone to crumble away. The action of frost, which tends to disintegrate the stone by the expansion in the freezing of the water enclosed in its pores, also causes the separation of the particles, and even in the absence of chemical action decay may result from that alone.

In addition, the water acts as a carrier of chemical agents, such as carbon-dioxide, carbonic, hydrochloric and sulphureous acids, all common in the atmosphere of towns; and these hasten the decay of the stone. Sandstone and bricks, being acid material, are not easily attacked by these gases; limestones on the other hand are easily corroded. Other things being equal, the more porous a stone the more easily it will be corroded. This combination of mechanical and chemical action often causes the decay to begin on the surface; this is not however always the case. It often happens that decay begins within the surface of the stone.

At a distance varying, according to its porosity, from $\frac{1}{8}$ in. to $\frac{1}{2}$ in. from the surface of the stone there is a critical place beyond which the water does not usually pass, and where it always remains longest. It is here, not actually on the surface but behind it, that the decay generally begins. As it progresses it throws off a scale, which is often found to be in good condition on its outer surface, although the inner surface is rotten. A kind of scale of disintegrated particles is laid bare, which is more absorbent than the healthy stone, and assists and promotes the progress of decay, which, if not arrested, will proceed with greater rapidity than ever.

Although there are some exceptions, it may be laid down as a rule that the universal cause of decay in stone is damp or the evil influences associated with or conducted by damp.

I have here taken stone as an example. Bricks are also liable to decay in exactly the same manner, and an inferior brick will decay quickly under these circumstances.

This saturation of the wall with rain or moisture from the atmosphere is the chief cause of damp, but if the materials used are of good quality and are capable of throwing off the damp quickly, little or no harm will be done. If good materials are not to be had, that which is at our disposal must be protected as much as possible; and it is some of the remedies for such cases that I have here noted.

Before passing on to them I might mention

the damp which is occasioned by inferior workmanship. Carelessly-fitted windows and window sills are a ready source; roughly-finished pointing may also let the water into the wall; but the chief evil is that of badly-constructed plumber work, or the omission of a damp-course in a chimney head or in a parapet wall.

When sea-water is used in the mixing of concrete for walls, it may cause an efflorescence, which is sometimes comparatively harmless, but which has a tendency to cause damp places in the structure that may lead to the destruction of plaster and paint, or perhaps to the detachment of fragments of the wall.

Cures.

Time is the only real test of the various methods adopted, and as few records are kept of these it will be seen that when one is called upon to find a remedy it will be necessary to select one which is most likely to suit the particular needs of the case, and which is likely to have the most permanent effect.

If the material is known to be inferior before the wall is built of it, several methods which I will describe can be used with effect; but if the defect is only noticed after the building is completed the remedies which can be applied are mostly of a temporary nature and require frequent renewing. It is therefore best, if there is any doubt as to the material, that some method should be employed to ensure that the interior of the building is kept dry.

If possible, the damp should be arrested on the surface of the wall, or it should be obstructed as near the surface as possible, so as to ensure that the greater portion of the wall is kept free from the damp.

Hollow Walls.

One of the most effective methods employed for brickwork is that of building hollow walls. As you all know, the common way of building these is with the $\frac{1}{2}$ in. wall divided from the main wall by an air-space of $\frac{1}{2}$ in. or 3 in., the two tied together by bonding bricks or metal ties. The $\frac{1}{2}$ in. portion of the wall is usually built on the outside of the main wall. The metal bonding ties are supplied in many different forms of cast and malleable iron and steel. A strip of steel, twisted in the centre to stop the passage of the water and turned up a little at the ends to form a key in the joint, makes a good tie. All metal ties should be galvanised to prevent corrosion and consequent loss of strength, and the little cost involved is compensated by the lasting power of the tie.

It is a good plan to leave openings in the brickwork at the foot of such walls, so that at the finish of the work the bottom of the air-space may be cleaned of the droppings and rubbish which may have accumulated during the building. These holes may be afterwards built up, or they may be covered with gratings to form ventilators.

The advantages of hollow walls are that they prevent the damp penetrating the wall further than the air-space, and if the thin portion is placed to the outside the damp is kept from the greater portion of the wall and at a greater distance from the interior of the building.

The air-space not only excludes the damp, but it acts as a non-conductor, which helps to keep the building warm.

The introduction of a vertical damp-course into the interior of the wall is another method which may be adopted. It consists of melted bitumen or asphalt run into the joints of the brickwork as the wall is being built, forming a continuous sheet of waterproofing material in the interior of the wall. This makes a very satisfactory job, and if properly done it will keep out the wet most effectively.

Cement Rendering and Tiles.

Of the various ways of waterproofing existing walls, Portland cement rendering is perhaps the most common with us. If this is carefully done, it is certainly successful, although the effect is not generally pleasing; 3 parts of good sharp sand to 1 of cement makes a good plaster, and care should be taken that the wall is rough enough to form a good key for it, or it may scale off after a time. It may be finished with a rough-cast or a smooth trowelled surface. This plaster is not of itself damp-proof, but the smooth surface formed throws off the water quickly and does not allow it to penetrate into

* A paper read before the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society on March 21st, 1902.



CHAPEL OF THE ASCENSION, BAYSWATER ROAD, LONDON, W.: FRONT. HERBERT P. HORNE, ARCHITECT. (Photo: H. Irving.)

the wall. The rough-cast work is therefore not so good, as the water retained in the inequalities of its surface may be blown or drawn into and through the wall. Roman cement may be used for this work in a proportion of 1 of cement to 1 of sand. Artisans' dwellings may be built very cheaply of inferior stone or brick faced in this manner so as to render them damp-proof.

Tiling is a good and cheap method of protection, which may be applied to new or old walls. The tiles are hung on laths, which are plugged to the wall, and they are lapped as in ordinary roofing work. It is not our custom to treat our walls thus, and I have not seen it used except for ornamental work on the upper storeys of villas, &c., but I understand that it is a very common practice in some parts of England.

The setting of tiles in cement on the surface of the wall is not a reliable practice. The tiles, to effectually throw off the water, have to be glazed, and the danger is that the least imperfection in the glaze allows water to enter into the body of the tile, which, expanding by freezing, causes the glaze to scale off and thereby renders the tile useless for the purpose intended.

Preservative Solutions.

A great number of paints and solutions have been tried for the waterproofing of stone and brickwork, but none of these seem to have come into general use. The application of a fatty or oily varnish, which will sink into the wall, will render the surface non-porous, but since most of these materials are themselves less durable than the stone, repetition of the process at intervals will be found necessary. A mixture of linseed oil and paraffin painted on the work in two or three coats will fill the pores and keep the stone dry for a time, but it discolours the stone badly. Paraffin wax applied hot and in solution with coal-tar naphtha may also be used.

Browning's solution is another of this order; it is composed of—

85.5 benzoline.
10.0 gum dammar,

2.0 wax.
2.0 sugar of lead.
.5 corrosive-sublimate.

This is another solution:—

2½ lb. of soft soap.
1 lb. rock alum.
1 gallon linseed oil.

The soap and oil to be boiled over a good fire a considerable time, till perfectly amalgamated. The alum to be finely-pounded and mixed with the oil in small quantities at a time, and the mixture to be constantly stirred until the alum is incorporated with the oil and soap. When this is done the mixture to be strained off into cans for use. It is very important that the walls should be perfectly dry when the mixture is applied.

The following is another recipe given for damp walls, though I cannot testify to its efficiency:—Take ½ lb. mottled soap to one gallon of water, to be applied *boiling* over the surface with a brush (not to be frothed); leave it for twenty-four hours to dry; then apply ½ lb. of alum to 4 gallons of water, leaving it for twelve hours to dissolve, and to be laid on as before. Hot weather is best for the application.

Ransome's method is to coat the stone with a thin film of silicate of lime. This is done by first washing the surface with silicate of soda; the surface is then played on with a solution of chloride of calcium, when a chemical change immediately takes place, the silicate of soda changing into silicate of lime, which is insoluble, and the chloride of calcium changing into chloride of sodium (salt), which is soluble in water and is easily washed off.

The Bath Stone Firms supply a material called fluat of magnesia for treating limestone; it is especially adapted for use on the stone taken from their quarries, but it can be used on any limestone. The crystals are dissolved in water and applied to the surface of the stone. As soon as it touches the stone it sets up a chemical action in the carbonate of lime, which forms a substance that prevents

the penetration of water. This firm also sells a special liquid for the treatment of materials which do not contain carbonate of lime. This solution, called Avant, deposits on the surface treated the lime necessary for the fluat of magnesia to act upon. By alternate dressings of these two solutions the same result is obtained as if the substances were naturally of a calcareous character. Both of these treatments are said to cost about 1d. per ft. super. of surface treated.

A solution which seems to have been successful in some cases is supplied by Szerdmeij & Co., of London. The manufacturers claim that their liquid thoroughly waterproofs the stone for all time without altering the appearance of it. This liquid is at present being tried on our municipal buildings, and we will have an opportunity of watching if a satisfactory result is obtained.

Several preparations of a different sort are supplied by Messrs. Blundell, Spencer & Co., Ltd., of Hull. One of these they call their transparent petrifying liquid, and they claim for it that while it does not materially alter the appearance of the material to which it is applied it renders stone, brick or cement impervious to moisture and to the deleterious gases of the atmosphere of towns.

Another preparation supplied by this firm is a bright drying liquid which may be had in various tints, and it imparts an enamel-like surface to the wall. This is mostly used for internal work, but for external work it can be got to dry with a dead flat surface to resemble the natural appearance of brick or stone.

Painting with ordinary oil paint is a common method of keeping damp from penetrating a wall, but as the work has to be re-done every two or three years, depending on the locality, it cannot be an economical method.

With reference to the use of those preservative solutions which render the stone or brick impervious, it may be said that ordinary structures of untreated porous material—although absorbing moisture readily—allow its egress to

take place just as readily and offer no hindrance to the transfusion of air through their walls.

A building with impervious walls, although excluding damp from without, includes internal damp and allows no ventilation through its pores.

Eaves, Cornices, Gutters, &c.

So much for the treatment of the walls themselves. I come now to the remedies (or rather the precautions which have to be observed) in the constructional work.

Projecting eaves are an advantage, and the more they project the more protection they offer to the surface of the wall. The objection to them is that they shade the wall from the drying influence of the sun's rays; thus damp which does get in is retained in the stone and causes rapid decay.

Cornices and all projections should be constructed to throw off the rain by means of throating and weathering, and everything should be done to keep the water off the face of the building.

All masonry, such as chimneys and parapet walls, should be provided with a suitable damp-proof course just at the roof level to prevent the rainwater from getting into the wall beneath. The rainwater gutters should have a sufficient fall to carry the water off quickly; they should be examined frequently and kept clean. The down pipes should be large enough to convey the maximum flow and prevent the frequent overflow of gutters.

In case of stoppage in gutters or down pipes overflows should be arranged, and these should be of sufficient length to throw the overflow water clear of the wall or projecting parts of it. Snow-guards should always be placed in gutters behind parapet walls and similar positions where the snow is likely to lodge and check the flow, and these should always be arranged to give a good run of water. These snow-guards should always be constructed of creosoted timber.

In conclusion, it must be evident that it

always pays to use only the best material and workmanship in the building, as patching is always unreliable, and it is often found that it costs more to make good bad work than it would have cost had it been done right at first.

CHAPEL OF THE ASCENSION, BAYSWATER, LONDON.

THE Chapel of the Ascension, Bayswater Road, London, W., is a "Chapel of Rest," no services being held there. It was designed by Mr. Herbert P. Horne and is decorated inside by Mr. Frederick Shields. At the request of the late Mrs. Russell Gurney, the architect and the painter made a tour to some of the cities of Northern Italy, and the beautiful façade of the principal church of Pietra Santa, in the Carrara district, was specially noted as suggestive of the kind of design desired by Mrs. Russell Gurney.

The only serious difference of opinion which arose between Mr. Shields and the architect as to the plans of the chapel was in connection with the lighting. Mr. Horne had provided for side windows, Mr. Shields strongly desired top lights. Eventually a compromise was arrived at, the windows being placed very high up along the north and south walls. The decorations are in oil painting, the plan adopted being that of riveting blocks of slate to the walls, leaving an air chamber behind, and then affixing the paintings to the slate with a composition of white lead, &c., after the manner practised by M. Puvis de Chavannes at Amiens. Gas having proved most destructive to oil paintings, it was provided in the deed of gift that no artificial light should ever be introduced into the Chapel of the Ascension, the hours of daylight being sufficient for the purposes contemplated. Thus, also, with the addition of an iron door to the organ loft, every possible precaution has been taken against the calamity of fire.

THE PARIS "METROPOLITAN."

LEUT.-COL. H. A. YORKE, Chief Inspecting Officer of Railways to the Board of Trade, has just presented to that body his report on the Chemin De Fer Métropolitain De Paris. The line already constructed is part of a scheme which will form a complete system of inter-communication between the different portions of the city of Paris. The complete scheme comprises a system of railways in shallow tunnels, having a total length of 38.86 miles, namely, a circular line more or less parallel to but nearer the centre of the city than the Ceinture Railway; two lines on the north side of the Seine traversing the city from east to west, and touching the circle line at each of their extremities; two lines traversing the city from north to south, and crossing the east-west lines. Only a short length of the system is at present open for traffic. The total cost of the entire scheme contemplated will be about £12,000,000. The authorised fares are 25 centimes (2½d.) first-class and 15 centimes (1½d.) second-class for any distance. Second-class return tickets, available for the rest of the day, are issued at 20 centimes (2d.) up to 9.0 a.m. The stations are mostly in arched tunnels having a clear width at the springing of 46ft. 6in. and a height above rail-level of 16ft. 5in. The station platforms are 24ft. long, sufficient to accommodate trains of eight coaches. The railway is worked by electricity on the (500 volt) continuous-current system. The tunnels were constructed as near the surface as possible, but the depth varies. As a general rule the top of the arch is about 3ft. 6in. below the surface of the street, but where the line passes below the main sewers of the Boulevard de Sebastopol and of the Boulevard d'Asnieres, or where one line crosses another, the depth is very much greater. On the other hand, the railway emerges into the open near the Place de la Bastille, and crosses the Canal Saint-Martin by means of a bridge. The whole of the



CHAPEL OF THE ASCENSION, BAYSWATER ROAD, LONDON, W.: FROM THE NORTH-EAST. HERBERT P. HORNE, ARCHITECT. (Photo: H. Irving.)

tunnelling, except at some of the stations, is arched, the side walls, arches and inverts being built of rubble masonry. The width of the tunnel for a single line is 12ft. 9 $\frac{1}{2}$ in., and for a double line 21ft. 8in., at rail-level. The underside of the arch is finished with a coat of Vassy cement $\frac{3}{4}$ in. thick, and the walls and invert with Portland cement. All the tunnels are whitewashed inside, and the stations are lined with glazed white tiles.

Dealing with the question of subways or tunnels as compared with the deep-level tube, Colonel Yorke says: "It cannot, I think, be doubted that, as regards the convenience of passengers and economy of working, the balance of advantage lies with the shallow tunnel, or subway, as compared with the deep-level tube. It is easier of access, affords greater opportunities for escape in case of a breakdown or accident, and possesses a purer atmosphere; but the difficulties of constructing such subways along the principal streets in London are formidable. Where, however, new thoroughfares are in process of formation, the obstacles to shallow subways are not so serious, and advantage may well be taken of the opportunities so offered to build subways for tramway or railway purposes, perhaps even for ordinary vehicular traffic, in the manner proposed by the London County Council along the new street now being made from the Strand to Holborn."

New Patents.

These patents are open to opposition until May 12th.

1901.—Blocks for Flat Arches.—4,437. W. W. WILSON, 140, Richmond Road, Crewe. The blocks are made with an internal wedge-shaped key at each side, fitting into corresponding recesses in the adjacent blocks.

Tiles.—6,350. R. STANLEY, Manor Court, Nuneston. Oil or other lubricant is automatically distributed over the inner walls of the die and also, if needed, on the faces of the plungers. The result is that the tiles are harder, especially on the arrises, and the faces and backs are made very smooth and polished.

Gravel Washing Machines.—6,863. S. J. & S. A. PEGG, both of Alexander Street, Leicester. The trough of the machine (in which the material is placed) is made in sections which can be removed at will, so that one that is worn can be renewed without interfering with the rest. A further improvement consists in making the legs adjustable as regards height, so that the trough may be placed at the proper angle to drain off the water whatever the level of the ground may be.

1902.—Wells and Shafts.—505. L. MONNOYER, 262, Avenue Louise, Brussels. The lining is shaped like a truncated cone instead of being cylindrical, and the space between it and the surrounding earth is filled with fragments of stone, by which means the construction of the lining can be commenced from the beginning of the sinking operations. In proportion as the sinking is continued the portion built descends by its own weight. The lining is seated on a timber base furnished with a cutting shoe.

Pipe Cutters.—1,681. G. MITCHELL, Naco, Co. Cochise, Arizona, U.S.A. The device consists of a sectional ring having three threaded rods passing through it with cutting wheels at their inside ends. The ring is made in two parts, which are drawn together as required by a clamp.

The following specifications were published on Thursday last, and are open to opposition until May 19th. A summary of the more important of them will be given next week. The names in italics are those of the communicators of the invention.

1901.—2,873. BROWN, street gas lighting. 3,048, NORRIS, rotary cutting tool for wood or similar material and method of shouldering door stiles. 5,374, BRIGGS, composition of mica and bitumen or pitch. 5,767, BARBALET, automatic gas and water valve for geysers. 5,834, KILLON, apparatus for the automatic discharge of sewage.

5,922, BURNEY, manhole doors. 6,623, ISSERLISS, lime and cement kilns. 6,800, BUTCHARD, BUTCHARD, BUTCHARD & GIBSON, manufacture of cement. 8,522, ROBERTS, operating the ventilators of greenhouses. 8,556, WEBER, imitation stone. 8,774, KENDALL, window sashes and frames. 9,675, JANDUS ARC LAMP & ELECTRIC CO., LTD., & JONES, arc lamps. 10,857, CLARK (*Füller & Ziegler*), manufacture of cement. 18,637, BREAKELL, grinding and pulverising mill. 25,239, HEAP & ODDY, manufacture of Portland slag cement and hydraulic lime.

1902.—658, EDWARDS, securing tiles to stoves, kitcheners, bath frames, &c. 728, INGHAM & LANGTON, bottom for Hoffmann kiln. 2,396, ADAMS, closets. 2,574, MOYLE & WARNER, tile floors. 2,603, JACKSON & JACKSON, hot-water or steam radiators. 2,927, DIXON, low-pressure heating apparatus.

Masters and Men.

The Kidderminster Operative Bricklayers have struck work for an advance of a penny an hour in their wages, so as to raise them from 8d. to 9d., and in addition they asked for an alteration of some of the working rules in the trade. A large number of labourers are affected. Representatives of the masters and men have had a conference, at which the latter expressed their willingness to resume work at halfpenny an hour advance instead of the penny they at first asked. The employers declined to give any advance, but offered the men arbitration on the points in the dispute, which was refused by the men.

The Bricklaying Question.—Mr. Stewart's statements respecting bricklaying in America (*see p. 67 of our issue for March 19th*) have been disputed by Mr. J. Oldham, an English bricklayer of twenty-five years' standing who has worked extensively in America and has been a delegate for a branch of the International Union of bricklayers of America. He says in the "Times": "Although their bricks are much lighter and smaller than ours, my experience is that nothing like the quantity stated by Mr. Stewart is ever even thought of there. Their bricks are 8in. by 4in. by 2 $\frac{1}{2}$ in., taking 1,170 to measure what 880 English ones do; so in a day's work given by Mr. Stewart 2,340 would be equal to 1,760 of ours. In working in America for what are called 'front lumpers,' and who pay a dollar a day more than the trade-union rate of wages, every satisfaction is given when 500 to 700 bricks are set, according to the class of work. I have worked on tenements (their lowest class of work), the average on these being less than 2,000 a day, the quality of work not bearing comparison with English." Mr. Oldham says in conclusion that New York has been built by Englishmen, and the most successful contractors in the class of work where it is possible for the largest number of bricks to be laid are Englishmen.

The Birmingham Dispute Settled.—An arrangement has been arrived at between the Management Committee of the Operatives and the Master-Builders' Association which finally settles the whole of the difficulties in the trade in Birmingham and the Midland Counties. The employers were anxious to reduce the wages from 9 $\frac{1}{4}$ d. per hour to 9d., but it has been decided that the wages will remain as before. The time for commencing work in the morning remains as before. In regard to overtime, hitherto the operatives have been paid time and a quarter from half-past five till six o'clock, and then time and a half. It has been arranged, however, that the men shall work from five o'clock until six without extra overtime payment, and that after six o'clock they shall be paid at the rate of time and a half. The men have also agreed to only take half an hour for dinner instead of one hour during the winter when engaged on outdoor work; but in the workshops the hour for dinner will still be conceded. In future only two hours' notice will be required on either side for the termination of an engagement, instead of 2 $\frac{1}{2}$ hours as formerly. The notice is to be handed in at the close of the day. It has been agreed to submit in future all differences to a mutual reference rather than have the trade dislocated.

At least, no stoppage of work has to take place under any circumstances in future until the matter in dispute has been brought before a sub-committee or a special arbitration board. It is now claimed that the employers and employed in the building trade in Birmingham are on a better footing to-day than in any other district in the Kingdom.

Labour in the Colonies.—The April Circulars of the Emigrants' Information Office, of 31, Broadway, Westminster, S.W., show the present prospects of emigration. This is the best season of the year for emigrants to go to Canada. There is a good demand for men in the iron and steel works at Sydney (Cape Breton), Hamilton, Sault St. Marie, and elsewhere; and some demand throughout Canada during spring and summer for carpenters, painters, masons and others in the building trades. In New South Wales the building trade is not so brisk as it was, and less wages are being accepted. The engineering trade continues good, with full rates of pay. The wharf labourers are agitating for a rise in their wages to 1s. 3d. instead of 1s. an hour. In Victoria there is no general demand for more labour, but a competent mechanic has not much difficulty in finding work. The various boards appointed under the Factories Act have fixed the minimum wages for labourers in the pottery trade at 36s. to 40s. per week of forty-eight hours, and for females over eighteen years of age employed in the making of general pottery at 20s. In South Australia considerable numbers of mechanics and labourers, more especially those in the engineering trades, have been out of work at Gawler; and at Port Augusta men have been thrown out of employment by the closing down of the smelters. There is practically no demand for more mechanics in other towns, but a skilled hand such as a mason, bricklayer, engine fitter, blacksmith, joiner or carpenter can generally find employment after looking about for a little. Reports received at the Government Labour Bureau in Western Australia at the end of last year show that there was a good demand for men at Perth, especially for those in the building trades; that there was no demand at Fremantle, Geraldton, Collie or Busselton; that there were many unemployed at Coolgardie, Kalgoorlie, Kanowna and neighbouring goldfields; that at Northam there was a very good demand for mechanics and unskilled labourers. In Tasmania, mechanics at Zeeham, Queenstown and Gormanston, on the west coast, and in the surrounding districts, are well employed; good fitters can generally get work without difficulty. In other parts of the State there is no general demand for more mechanics, but there is an opening for them if they have a little money. In New Zealand the building trades have been busy generally, especially at Auckland, Gisborne, Napier, New Plymouth, Westport, Christchurch and Invercargill; but at Dunedin many men are out of work. The engineering trade is fairly well employed, especially at Westport and Timaru, but at Dunedin many are unemployed. In South Africa, both in Cape Colony and Natal, there is a good demand for skilled mechanics, especially those in the building trades, if they have a little money to live on at first, but no one is now allowed to land in South Africa without a permit. This must be applied for at the Permit Office, 47, Victoria Street, London, S.W. The applicant must possess £100 or prove that he is in a position to maintain himself in South Africa. Applicants living within fifty miles of London must apply in person. These permits are no guarantee that the holders will be allowed to proceed inland.

The Will of Mr. Edward Oslow Ford, R.A., has been proved by Mr. Matthew Ridley Corbet, A.R.A., and Mr. Wolfram Oslow Ford, the son, the value of the estate amounting to £10,720.

The Iron and Steel Institute will hold its annual meeting at the Institution of Civil Engineers, Great George Street, Westminster, on Wednesday and Thursday, May 7th and 8th next, commencing each day at 10.30 a.m. The Bessemer Gold Medal for 1902 will be presented to His Excellency F. A. Krupp, of Essen, and many interesting papers will be read and discussed. The annual dinner will be held on the Wednesday in the Grand Hall of the Hotel Cecil.

Keystones.

Mr. Henry Rose, architect, of Chard, died recently. He was for twenty-five years a member of the Architectural Association.

A **Coronation Memorial** at Hertford is proposed to be erected. It will consist of classrooms in connection with the local Public Library and School of Art. The estimated cost is £1,250.

A New Edition of "**Hortus Inclusus**"—letters written by John Ruskin to the Misses Beever, Coniston—is to be published this month by Mr. George Allen, price 6s. nett.

A New Infirmary at Highfield, Knotty Ash, is to be erected. Messrs. Jones & Sons, Pleasant Street, Liverpool, are the contractors, the estimated cost being £74,650. The architect is Mr. Edgar Kirby.

The Estate of the late **Mr. Bentley**, architect of the new Roman Catholic Cathedral at Westminster, has been valued at £5,961 13s. 9d. gross, and £4,052 17s. 9d. nett. Mr. Bentley named no executor, but appointed his wife as universal legatee.

In **St. Clement Danes Church**, Strand, W.C., a series of five stained-glass windows have been erected. One of these—that on the north-east corner—is a memorial to Dr. Johnson, who worshipped in a gallery seat close by for many years. Messrs. Curtiss, of Soho, designed the series.

A New Hall at Port Erin for public meetings, social gatherings, concerts, &c., is being erected at the rear of St. Catherine's Church. It is being built of local stone, with limestone dressings from Scarlett. In the main building there will be seating accommodation for about 240 persons. Messrs. William Coslain & Son are the masons, and Mr. Henry Clague is the joiner. Mr. Armitage Rigby is the architect.

Bristol Cathedral Sedilia.—The Dean and Chapter of Bristol Cathedral have given the order for the restoration of the sedilia, sufficient funds having been received to justify their restoring them in part. A further sum of £300 is still needed to complete the cost of the restoration. The work will be forthwith undertaken by Mr. Hitch, of London, to whom the beautiful reredos was entrusted.

The Monument to **Charles Garnier**, the architect of the Paris Opéra, is in course of erection in front of the façade in the Rue Auber, Paris. M. Van den Sande, the sculptor who co-operated with Garnier in the construction of the Paris National Opera, has just died in the French capital. His last days brought him great trouble, domestic affliction, pecuniary difficulties and ill-health, making his life extremely miserable. So meagre was his studio furniture that, on being sold for debt, it realised only 60fr.

An Addition to the **Banffshire Lunatic Asylum** buildings at Ladysbridge, Banff, in the shape of a new block for the accommodation of male patients, is being erected. A new boiler-house is also being built for the asylum. Messrs. W. & J. Smith & Kelly, Union Street, Aberdeen, are the architects for the new block. The contractors are:—Mason, Mr. David Forsyth, Elgin; carpenter, Mr. James Day, Botriphnie; plasterers, Messrs. Sellar & Co., Aberdeen; plumber, Mr. H. J. Watson, Banff; slater, Mr. John Hutcheson, Banff; glaziers, Messrs. Charles Innes & Co., Banff; smithwork, Mr. Thomas Paton; heating engineers, Messrs. Mackenzie & Moncur, Ltd., Edinburgh.

Business Offices for the Barton Regis Guardians and an office for the registration of births, marriages and deaths have been opened adjoining the workhouse, Southmead, Westbury-on-Trym. It was not until 1847 that the workhouse and offices (that have done duty for fifty-five years) were first used at Eastville. The extension of the city boundaries made it desirable for the Guardians to provide a new workhouse. The main building is being erected at Southmead by the contractor, Mr. H. A. Forse. The cost of the site was £3,700, and the outlay for the new building, furnishing and machinery will amount to £29,000. The buildings are divided into five main blocks, and the architects—Mr. A. P. I. Cotterell, A.M.I.C.E., Bristol, and Mr. W. H. Thorpe, F.R.I.B.A., of Leeds—have adopted the style of English Renaissance.

Richmond Hill View.—The Twickenham District Council have decided to increase their contribution towards the purchase of the Marble Hill Estate from £3,000 to £6,000.

An **Art Museum** is proposed to be erected in Aberdeen in connection with the Art Gallery. The museum, it is intended, will contain casts of the finest examples of Greek, Italian and other art, and is expected to prove important and useful to the granite industry of the district.

A New Wesleyan Church at Wallsend has been erected at the corner of Laburnum Avenue and High Street. Mr. McHarg was the contractor, and Mr. J. Walton Taylor, of Newcastle, the architect. It accommodates 800 persons. The cost was about £6,500.

The **French School in Athens**.—A new branch of the French School of Archaeology, destined for the reception of students of other nations which have no separate institution at Athens, has been opened. The new addition to the French school will confer great advantages on students of art and archaeology, who come to Athens in increasing numbers, and will enhance the already great reputation of this celebrated institution.

Mr. David Howorth, architect and surveyor, of D. Howorth & Son, Lord Street, Liverpool, died recently at the age of seventy-seven. Mr. Howorth had not of late taken any active part in the business, which has been carried on by his son, Mr. F. A. Howorth. Mr. Howorth commenced to practice in Liverpool in the early 'fifties, and was widely known in the building trade, especially as a quantity surveyor, in which capacity he enjoyed a high reputation.

New House, South Hill, Bromley, Kent.—This house is now being built, and the outside finished with rough-cast, the roofs being covered with tiles and the chimney stacks built faced with red bricks. The hall and staircase is panelled out 7ft. 3in. high, with oak staircase and floor. The glazing throughout is leaded, except the lower lights to the living- and dining-rooms, and the house is fitted with heating pipes and electric light. Mr. Edgar H. Selby, 8, Buckingham Street, Adelphi, W.C., is the architect, and the general contract is being carried out by Mr. F. P. Duthoit, builder, of Bromley.

Solicitors' Offices at Worthing. — Premises No. 26, Chapel Road have recently been erected for Messrs. Bennett & Marsh. The front is faced with red bricks with gauged window sills and stone sills. The roofs are covered with Westmoreland slates, and the glazing is leaded. At the back of the premises are the house-keeper's rooms, which, however, communicate with the ground floor and also with the half-landing of the office staircase. A strong-room is provided on the ground floor, and the offices are fitted with the electric light. The architect is Mr. Edgar H. Selby, of 8, Buckingham Street, Adelphi, W.C.; Messrs. Snewin & Son, of Worthing, were the builders.

The **New Palace of the Swiss Parliament** at Berne was opened last week by the members of the Swiss Federal Council and the Federal Assembly. The new Palace was sanctioned in 1892, and begun in 1894. The buildings, which have cost eight million francs, were designed by Professor Auer, of St. Gall, under whose direction they were carried out. In conformity with the recommendation of the Legislature, none but Swiss artists and Swiss material were employed in the embellishment of the building. The new Palace, which is surmounted by a lofty cupola, is placed between the two Government Palaces, and the whole now constitutes one building.

The **House of Mr. Alfred Gilbert**, R.A., in Maida Vale, W., which has been sold, was not, as has been stated, designed by Mr. Gilbert himself. He merely stated his requirements and made his suggestions; but the architect was Mr. Howard Ince, whose design was exhibited at the Academy in 1893. In the original design was included not only the series of studios and the house as built and intended for the residence of Mr. Gilbert's father, but also a larger house for Mr. Gilbert's own use. This the architect placed on the eastern side of the site, the billiard- and music-rooms being common to both. But the carrying out of the entire scheme was found too expensive, and is now left to the enterprise of the new tenant, whoever he may be.

The late **Mr. W. W. Williams**, architect, of Swansea, was buried last week.

Change of Address.—Mr. A. E. Mullins, architect and surveyor, has removed his offices from 16, Church Street, Camberwell Green, to 48, Peckham Road, S.E., nearly opposite Camberwell Town Hall.

The **New Town Hall** at Colchester is to be opened by Lord Rosebery, and he will be presented with a key and a casket. Views of the municipal pile will be worked into the design of the casket.

Mr. H. H. Collins, F.R.I.B.A., F.S.I., has been unanimously elected to the chairmanship of the Public Health Department of the Paddington Borough Council, in succession to the late Sir George Harris.

Additions and Alterations at Windsor Station are being made to the Royal waiting-room by the Great Western Railway. The extension, which, like the original building, is constructed of Bath stone and granite, is 40ft. long. The additional space thus gained enables separate apartments to be provided for the King and Queen when using the terminus.

New Race Club and Grand Stands at Manchester have been erected on the new course at Broughton. The whole of the buildings are in the Early Renaissance style, the lower portion of the ground floor being faced with red stock bricks, with stone dressings to the doors and windows. The timber-work of the upper portion of the building is ornamented.

A **New Parish Hall** at Dover has been erected in St. James Street from designs by Mr. Beresford Pite, F.R.I.B.A. Messrs. Brisley were the builders. The section in the rear, with a frontage to Russell Place, still remains to be completed. The St. James Street frontage has an entrance in the centre, under a semicircular arch, with bay windows on either side.

Manchester City Architect.—Mr. Henry Price, chief of the Architectural Department and Surveyor of Buildings to the Birmingham Corporation, has been recommended by the Town Hall Committee for appointment by the Manchester City Council to the newly-created office of City Architect. Mr. Price has been five years in Birmingham, and was prior to that chief assistant to the Building Surveyor at Liverpool. There were thirty-nine applicants for the Manchester appointment.

A **New Hall** at Aberdeen has been erected for the **Enzie United Free Church**. The frontage of the hall is to Main Street, and is Gothic in style, the walls being rock-faced ashlar. It is 51ft. by 31ft., and seats 300 persons. The contractors were:—Builder, Mr. Legge, Fochabers; joiners, Messrs. Hendry Brothers, Portgordon; plasterer, Mr. R. Reid, Portgordon; slater, Mr. Barclay, Buckie; painter and glazier, Mr. Macdonald, Portsoy; and plumber, Mr. Campbell, Buckie. The architects were Messrs. D. & J. R. Macmillan, Aberdeen.

George's Dock Site, Liverpool.—It has been decided that the site of the former George's Dock remaining unallotted after the extension of Water Street, Brunswick Street and James Street, the erection of the new head offices of the Mersey Docks and Harbour Board, and the new Pierhead Baths, shall be strictly reserved for buildings in character with the docks offices and the baths. Various schemes, including an arcade and shops, have been rejected in favour of a policy confining the residue of the site to offices and kindred buildings.

The **Curious Octagonal Hall** at Godalming, which stands at the junction of High Street and the Portsmouth Road, which has been so long threatened with destruction, has been saved by an offer of Mr. Thackeray Turner, of the Society for the Preservation of Ancient Buildings. A petition appealing to the town council to allow the building to remain as a specimen of a market hall erected when George III. was king was recently signed by Prince Christian, Princess Louise, Prince Albert of Schleswig-Holstein, several eminent R.A.'s, and other well-known people, and this has influenced the local authority. Mr. Thackeray Turner has been granted a seven years' lease of the building, which it is hoped to utilise as a reading-room, the council reserving the right of using it for proclamations and similar ceremonies.

COMING EVENTS.

Wednesday, April 9.

SANITARY INSTITUTE.—Dr. Patrick Manson on "Prevention of Malaria" (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. E. Worth, M.I.C.E., on "Scavenging, Disposal of House Refuse," 7 p.m. Inspection and Demonstration in the District of Islington, and at the Borough Disinfecting Station at 2 p.m., conducted by Mr. James R. Leggett.

INSTITUTE OF SANITARY ENGINEERS, LTD.—Meetings of Examination and Literary Committee at 3.30 p.m., of General Purposes and Finance Committee at 4 p.m., Election Committee at 5.15 p.m., and Sessional Meeting at 7 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students Visit to the Works of Messrs. Doulton & Co., Ltd., High Street, Lambeth, S.E.

Thursday, April 10.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

ROYAL INSTITUTION.—Prof. Dewar on "The Oxygen Group of Elements,"—I., 3 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Discussion, Messrs. Swinburne & Cooper's paper on "Problems of Electric Railways," 8 p.m.

Friday, April 11.

ARCHITECTURAL ASSOCIATION.—Special General Meeting to consider alterations and additions to by-laws. Mr. W. D. Carie on "The Preservation of Ancient Buildings," 7.30 p.m.

PHYSICAL SOCIETY.—1. Mr. Grant, "An Apparatus for Vapour-pressure Measurements." 2. Mr. Morris, "The use of Cathode Rays for Alternating-Current Measurements." 3. Mr. Morris, "An Experiment on the Current Growth in an Inductive Circuit." 4. Dr. R. A. Lehfeldt, "An Electric Heater." 5. Mr. S. A. F. White, "Note on the Compound Pendulum," 5 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. James I. Little on "The Sewage Disposal of a Country House," 8 p.m.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Annual Meeting.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. W. Hunting on "Health and Disease in Animals destined for Food," 7 p.m.

ROYAL INSTITUTION.—Prof. Dewar on "Problems of the Atmosphere," 9 p.m.

Saturday, April 12.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Inspection and Demonstration at the Sewage and Destructor Works, Baling, at 2.15 p.m., conducted by Mr. Charles Jones, M.I.C.E.

ARCHITECTURAL ASSOCIATION.—Fifth Spring Visit to the Eastern Telegraph Company's Offices, Finsbury Pavement, by permission of the architect Mr. John Belcher, A.R.A., 2.30 p.m.

Monday, April 14.

SURVEYORS' INSTITUTION.—Mr. O. H. Hooper on "Compensation for Fruit Planting," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. W. Hunting on "The Organs of the Body in Animals," 7 p.m.

BRISTOL SOCIETY OF ARCHITECTS.—Annual General Meeting. Election of Council and Officers. Mr. J. Awdood Slater on "A Continental Tour," 8 p.m.

Tuesday, April 15.

NATIONAL REGISTRATION OF PLUMBERS (DISTRICT COUNCIL FOR CARDIFF, SOUTH WALES AND MONMOUTHSHIRE).—Paper by Mr. Edwin Seward, F.R.I.B.A., at 8 p.m.

ROYAL INSTITUTION.—Dr. Allan Macfadyen on "Biological Enquiry"—I., 3 p.m.

Wednesday, April 16.

BRITISH ARCHEOLOGICAL ASSOCIATION.—Meeting at 1.30 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. W. Hunting on "Practical Methods of Stalling and Slaughtering Animals," 7 p.m. Inspection at Demonstration at Knacker Yard.

SOCIETY OF ARTS.—Mr. J. Bridges Lee, M.A., on "Photography as applied to Architectural Measurement and Surveying," 8 p.m.

Thursday, April 17.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Annual Dinner at the Hotel Cecil.

SOCIETY OF ARTS (Indian Section).—Mr. Sidney Preston, A.M.I.C.E., on "Recent Developments in Punjab Irrigation," 4.30 p.m.

Friday, April 18.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. A. Needham Wilson on "A Tour through the South of France," 7.30 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting, at 8 p.m.

VIRING CLUB. Thomas Street, Grosvenor Square, W.—Mr. A. W. Johnston, F.S.A., Scot., on "The Earl's House and Round Church of Orpington, Orkney," 8.30 p.m.

ROYAL INSTITUTION.—Sir John H. A. Macdonald on "The Auto-Car," 9 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. James King on "Disinfecting Meat," 7 p.m.

Saturday, April 19.

SANITARY INSTITUTE.—Inspection and Demonstration for Sanitary Officers at Morden Hall Dairy Farm, Morden, Surrey, at 3 p.m., conducted by Mr. Oscar J. White.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Traquair House and the Town of Innerleithen.

Surveying and Sanitary Notes.

Society of Ordained Surveyors.—The report of the Council for the session 1901-2 states that the Society is in a flourishing condition. The funds at the close of the financial year amounted to £245 11s. 7d. Four candidates have come forward for the preliminary examination to be held this month and one for re-examination, while five candidates have presented themselves for the final examination (one each from Edinburgh, Inverness, Perth, Kirkcaldy and Dumfries). Mr. Forrest H. Lightbody is the hon. secretary (56, Queen Street, Edinburgh).

CURRENT MARKET PRICES.

FORAGE.			
		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	—
Clover, best ..	per load	4 15 0	5 10 0
Hay, best	do.	5 5 0	5 12 6
Sainfoin mixture ..	do.	4 10 0	5 5 0
Straw	do.	1 8 0	2 0 0

OILS AND PAINTS.			
Castor Oil, French ..	per cwt.	1 7 0	1 8 7
Colza Oil, English ..	do.	1 7 0	—
Coppers	per ton	2 0 0	—
Lard Oil	per cwt.	2 9 6	—
Lead, white, ground, carbonate ..	do.	1 4 10	—
Do. red	do.	1 0 4 1/2	—
Linseed Oil, barrels ..	do.	1 10 3	1 10 6
Petroleum, American ..	per gal.	0 0 6 1/2	—
Do. Russian	do.	0 0 5 1/2	0 0 6 1/2
Pitch	per barrel	0 7 0	0 7 6
Shellac, orange	per cwt.	5 17 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 11 0	1 11 6
Tar, Stockholm	per barrel	1 3 6	—
Turpentine	per cwt.	1 11 0	—

METALS.			
Copper, sheet, strong ..	per ton	71 0 0	—
Iron, Staffs, bar	do.	6 2 6	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 12 6	11 15 0
Lead, pig, Soft Foreign ..	do.	11 10 0	—
Do. do. English common brands	do.	11 15 0	—
Do. sheet, English 3lb per sq. ft. and upwards ..	do.	13 0 0	—
Do. pipe	do.	13 10 0	—
Nails, cut clasp, 3in. to 6in. ..	do.	9 0 0	—
Do. floor brads	do.	8 15 0	—
Steel, Staffs, Girders and Angles	do.	6 15 0	7 5 0
Do. do. Mild bars	do.	6 10 0	7 0 0
Tin, Foreign	do.	117 10 0	118 0 0
Do. English ingots	do.	121 10 0	—
Zinc, sheets, Silesian	do.	21 0 0	—
Do. do. Vieille Montaigne ..	do.	21 10 0	—
Do. Spelter	do.	17 15 0	18 0 0

TIMBER.			
SOFT WOODS.			
Fir, Dantzic and Memel ..	per load	2 1 0	—
Pine, Quebec, Yellow ..	per load	4 7 6	6 0 0
Do. Pitch	do.	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 10
Do. Petersburg	per bundle	0 8	—
Deals, Archangel 2nd & 1st per P. Std.	do.	15 5 0	22 0 0
Do. do. 4th & 3rd	do.	10 15 0	12 10 0
Do. do. unsorted	do.	6 12 6	6 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow ..	do.	13 15 0	—
Do. do. 2nd	do.	10 0 0	13 15 0
Do. do. White	do.	7 5 0	11 10 0
Do. Swedish	do.	9 15 0	15 10 0
Do. White Sea	do.	10 10 0	11 15 0
Do. Quebec Pine, 1st	do.	19 10 0	21 5 0
Do. do. 2nd	do.	9 0 0	13 10 0
Do. do. 3rd & 4th	do.	12 0 0	—
Do. Canadian Spruce, 1st ..	do.	7 10 0	9 5 0
Do. do. 3rd & 2nd	do.	7 5 0	9 0 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 5 0	10 15 0
Flooring Boards 1in. prepared, 1st	per square	0 10 3	0 11 6
Do. 2nd	do.	0 9 9	0 10 6
Do. 3rd & 4th	do.	0 9 0	0 11 6

HARD WOODS.			
Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, Im., Cuba	per ft. sup.	0 4 3/4	—
Do. Honduras	do.	0 0 1 1/2	—
Do. Tobasco	do.	0 0 6 1/2	—
Elm, Quebec	per load	0 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0 0 4 3/4	—
Do. African	do.	0 0 3 3/4	—
Do. St. Domingo	do.	0 0 5 1/2	—
Do. Tobasco	do.	0 0 3 3/4	—
Do. Cuba	do.	0 0 4 1/2	—
Oak, Dantzic and Memel ..	per load	3 15 0	5 7 6
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ..	do.	6 0 0	17 10 0
Wainscot, Riga (Baulk) ..	do.	3 15 0	5 15 0
Do. Odessa Crown	do.	3 15 0	5 15 0
Walnut, American	per cub. ft.	0 3 1	—

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
April 10	Middleton-on-the Wolds—Chapel and Schools	Wesleyan Trustees	Gelder & Kitchen, 76 Lowgate, Hull.
10	London, N.—Gate Porter's Lodge, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
10	Hither Green, S.E.—Engineer's Cottage	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
10	Hawthorn, Yorks—Chapel, &c.	—	Walker & Collinson, Architects, Swan Arcade, Bradford.
10	Mansfield—Organ Chamber, &c.	—	O. H. Fowler, Architect, Durham.
10	Burnopfield, Durham—Dwelling House	J. Watson	G. T. Wilson, 21 Durham Road, Blackhill.
10	Slaithe, Yorks—Villa	—	J. Berry, 3 Market Place, Huddersfield.
10	Gosport—Fire Station	Urban District Council	H. Frost, Surveyor, Council Offices, Gosport.
10	Petersfield—Methodist Church and School	—	Rev. C. Lomas, 2 The Spain, Petersfield.
11	Qarthorpe, near Bedale—Farm Buildings	R. Boston	T. Winn, 92 Albion Street, Leeds.
11	Crayke, near Easingwold—Church	County Council	J. F. Todd, Architect, Easingwold.
11	Carnarvon—Repairs to Bridges, &c.	—	County Surveyor, Carnarvon.
11	Rotherham—Minister's House	—	J. Platts, Architect, High Street, Rotherham.
11	Salford—Nurses' Home	—	H. Lord, 42 Deansgate, Manchester.
11	Belfast—Pair of Semi-detached Villas	—	Blackwood & Jury, 41 Donegall Place, Belfast.
12	Swindon—Sunday School	—	R. J. Beawick, 35 Regent Street, Swindon.
12	Treorkey, Wales—Extension of Premises	Industrial Co-operative Society	J. Rees, Architect, Centre.
12	Nuneaton—Bridges, &c.	Urban District Council	J. S. Pickering, Surveyor, Council Offices, Nuneaton.
12	Carnarvon—Two Houses	—	R. T. Hughes, Bangor Street, Carnarvon.
12	Carnarvon—Alterations to Workhouse	—	R. L. Jones, 14 Market Street, Carnarvon.
12	Emly, Ireland—Creamery	St. Ailbe's Co-operative Dairy Soc., Ltd.	Very Rev. M. C. Power, P.P., Emly.
12	Belfast—Two Villas	Lunatic Asylum Committee	Graeme-Watt & Tulloch, 77A Victoria Street, Belfast.
12	Thornbury—Twelve Through Houses	—	Fairbank & Wall, Architects, Craven Bank Chambers, Bradford.
12	West Norwood—Three Houses with Shops	—	Mr. Blackburn, 6 Queen Anne's Gate, Westminster.
14	Nab Wood, Shipley—Villa Residence	—	A. Sharp, Architect, Pearl Assurance Bldg., Market St., Bradford.
14	Carmarthen—Cattle Markets	—	F. J. Finglah, Borough Surveyor, John Street, Carmarthen.
14	Kilcoe, Ireland—Church	—	M. A. Hennessy, 74 South Mall, Cork.
14	Rhoslanerchrugog, Wales—Schools and Classrooms	Congregation Chapel Committee	No. 54 Hall Street, Rhoslanerchrugog.
14	Old Brentford—Schools	School Board	N. Parr & A. E. Kates, 5 Brent Road, Brentford, W.
14	Ilford, Essex—School	School Board	O. J. Dawson, 7 Bank Buildings, Ilford, Essex.
14	Walthamstow—Alterations, &c., to Schools	School Board	H. Prosser, Board Offices, High Street, Walthamstow.
14	Bath—Works at Hospital	—	F. W. Gardiner, Architect, Barton Street, Bath.
14	Leavesden, near Watford—Disinfectors, &c., Buildings	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
14	Pontnewynydd, Wales—Laundry Building, &c.	Pontypool Steam Laundry Co., Ltd.	D. J. Lougher, Bank Chambers, Pontypool.
14	Edinburgh—Fireclay Bricks and Retorts, Lime, &c.	Gas Commissioners	Chief Engineer, Gasworks, New Street, Edinburgh.
14	Northwich—Enlargement of Central Station	Electric Supply Co.	E. T. Ward, Secretary, 25 Castle Street, Northwich.
14	Kendal—Science and Art Rooms at School	Grammar School Governors	G. L. Hoggarth, Architect, Kendal.
15	Barrow-in-Furness—Alterations to Chapel	—	Sames & Henshaw, Architects, Abbey Road, Barrow.
15	Crumlin, Mon.—Cottage	Great Western Railway Co.	Engineer, Newport Station.
15	Great Horton, Bradford—Bakery, &c.	Industrial Society, Ltd.	Society's Offices, Great Horton, Bradford.
15	West Kilbride, Scotland—Slaughter House	Ayrshire County Council	A. McQuaker, Architect, Glenbank, Dally.
15	Aldershot—Eight Cottages, Stabling, &c.	County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
15	Barton-on-Humber—Mission Church	—	H. B. Bell, 8 Park Square, Leeds.
15	London, S.E.—Offices, Nurses' Home, &c.	Lambeth Guardians	Fowler & Huggan, 9 Craig's Court, Charing Cross.
15	Aldershot—Police Station	Southampton County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
15	Barnes—School Extension	School Board	O. Innes, 50 Cannon Street, E.C.
16	Headington—Pair of Houses	Co-operative & Industrial Society, Ltd.	J. R. Wilkins, Architect, Market Street, Oxford.
17	Burnham-on-Ourch—Additions to Schools	School Board	Chancellor & Son, Architects, Chelmsford.
16	Windermere—Additions to Works	Somerville Brothers	R. Walker, Architect, Windermere.
16	Llanelli, Wales—Operating Theatre	—	W. Griffiths, Architect, Falcon Bridge, Llanelli.
16	Portsmouth—Church	—	G. E. Smith, 145 Victoria Road North, Southsea.
17	Portadown, Ireland—Parochial Hall	—	J. W. Walby, Architect, Portadown.
17	Sutton Scotney, Hants—Pair of Cottages	Tramway and Electricity Committee	W. & G. A. Bell, Architects, Andover.
17	Ilkeston—Car Shed, Offices, &c.	Admiralty	Borough Surveyor, Town Hall, Ilkeston.
18	St. Anthony's Point, nr. Falmouth—Coastguard Bldgs.	School Board	Director of Works Dept., Admiralty, 21 Northumberland Av., W.O.
19	Gelligaer, Wales—Repairs, &c., to Schools	—	James & Morgan, Architects, Charles Street Chambers, Cardiff.
19	York—Church Restoration	—	Boreham & Morton, 24 John Street, Sunderland.
19	Kendal—Two Shops, Billiard Room, &c.	—	J. Buntley, 7 Lowther Street, Kendal.
19	Old Trafford, Manchester—Public Baths	Stretford Urban District Council	E. Woodhouse, Architect, 83 Mosley Street, Manchester.
19	Edgeworthstown, co. Longford—Convent Schools	—	I. F. McNamara, 50 Dawson Street, Dublin.
21	Dublin—Houses	Great Northern Railway Co. (Ireland)	Company's Engineer-in-Chief, Dublin.
21	Wardhouse, Scotland—House	School Board	A. Taylor, Overseer, Wardhouse.
21	Gloucester—Infants' School	Hornsey Urban District Council	H. Medland, 15 Clarence Street, Gloucester.
21	London, N.—Firemen's Quarters & Fire-Escape Shed	Hammersmith Guardians	E. J. Lovegrove, Offices, Southwood Lane, Highgate, N.
21	Shepherd's Bush—Boundary Walls	Hammersmith Guardians	J. H. Richardson, 87 Finsbury Pavement, E.C.
21	Wormwood Scrubs—Boundary Walls and Railing	—	Giles, Gough & Trollope, 25 Craven Street, Strand, W.O.
21	Kilkeel, co. Down—Additions, &c., to Church	West Ham Corporation	W. H. Stephens & Son, 13 Donegall Square North, Belfast.
22	Stratford, E.—Steam Roller Shed	—	Borough Engineer, Town Hall, West Ham, E.
22	Enniskillen—Repairs to Houses	—	W. Frazer, Eden, Enniskillen.
22	Tendring, Essex—Alterations, &c., to Workhouse	—	A. J. H. Ward, 42 Church Street, Harwich.
22	Blackburn—Bank Premises	—	Stones & Stones, 10 Richmond Terrace, Blackburn.
22	Leatherhead—Brick Wall	—	Rev. A. F. Rutty, St. John's Foundation School, Leatherhead.
22	Wimbledon—Library Extensions	—	R. J. Thomson, 47 Hill Road, Wimbledon.
23	Glennamaddy, Ireland—Alterations, to Workhouse	—	J. E. D'Arcy, Clerk, Glennamaddy.
25	Uckfield, Sussex—Police Buildings	—	F. J. Wood, County Surveyor, County Hall, Lewes.
28	Lumphinnans, Scotland—Public House, &c.	—	W. Birrell, 209 High Street, Kirkcaldy.
30	Scarborough—Retaining Wall and Pipe Subway	—	W. J. Oudworth, Company's Engineer, York.
May 10	Bundoran, Ireland—Rebuilding House	—	W. S. Jervois, Architect, Armagh.
No date.	Esholt—Residence	J. W. Dixon	W. Jones, 2 Hamilton Place, Leeds.
10	Crofton, Blyth—School	Cowper School Board	A. J. Shaw & T. H. Vowles, 69 St. James Street, Barnley.
10	Holmgate, Clay Cross—Twelve Villas	—	E. Oxley, Architect, Clay Cross.
ENGINEERING:			
April 10	Manchester—Coal and Ash Conveyors	Corporation	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
10	Leeds—Water Main	Corporation	City Engineer, Town Hall, Leeds.
10	Alexandria, Egypt—Hydraulic Press	Director-General	Director-General of Customs, Alexandria.
12	Edinburgh—Cast and Iron Pipes, &c.	Lord Provost, Magistrates and Council	Resident Engineer, 5 Dewar Place, Edinburgh.
12	Falkirk—Electric Lighting Plant	Corporation	Burstable & Monkhouse, 14 Old Queen Street, Westminster, S.W.
13	Loughborough, Leics—Refuse Destructor, &c.	Town Council	A. H. Walker, Borough Engineer, Town Hall, Loughborough.
12	Warrington—Motor	Electricity Committee	W. H. Grimsdale, Borough Electrical Engineer, Electric Light Station, Howley, Warrington.
12	Bathgate, Scotland—Sewage-Disposal Works	Town Council	P. O. Hart, 134 St. Vincent Street, Glasgow.
12	Carnarvon—Cooking Apparatus, &c.	—	R. L. Jones, 14 Market Street, Carnarvon.
14	London, S.E.—Electrical Stores	Bermundsey Borough Council	Mr. Vincent, Boro' Electrical Engineer, Town Hall, Bermundsey.
14	Leavesden, near Watford—Heating, &c., Asylum	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Office, Embankment, E.C.
14	Stafford—Mechanical Engineering Work	Waterworks Committee	W. Blackshaw, Borough Engineer, Borough Hall, Stafford.
14	Hindley, Lancs—Steam Pump	Urban District Council	A. Holden, Surveyor, Council Offices, Hindley.
14	Stamford—Mainlaying	—	J. Euston, Engineer, Northampton.
14	Stamford—Reservoir	—	J. Euston, Engineer, Northampton.
14	Manchester—Steel Joists and Bridges	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
14	Manchester—Sluice Valves, Pipes, &c.	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
15	Rochester—Dredging	Medway Conservators	Secretary, 42 High Street, Rochester.
15	Christiana—Pumps	Stavanger Waterworks	Stadsingenörkonterter, Stavanger.
15	Sligo—Cooking Range	Asylum Committee	Resident Medical Superintendent, Asylum, Sligo.
15	India Office, S.W.—Workshop Machines	Secretary of State for India in Council	Director-General of Stores, India Office, Whitehall, S.W.
15	Malvern Wells, Chacewater & Abertillery—Footbrgs.	Great Western Railway Company	Engineer, Paddington Station.
16	Leytonstone, E.—Fire Mains, Hydrants, &c.	West Ham Union Guardians	F. E. Hillery, Clerk, Union Workhouse, Leytonstone, N.E.
16	Devonport—Tramways	Corporation	C. Chadwell, 20 Victoria Street, Westminster.
16	Leytonstone, E.—Laundry Machinery	West Ham Union Guardians	F. E. Hillery, Clerk, Workhouse, Leytonstone, E.
16	London, E.C.—Engine and Machinery	Pekin Syndicate, Ltd.	T. Gilbert, 110 Cannon Street, E.C.
16	Southampton—Tramways	Corporation	Borough Engineer, Municipal Offices, Southampton.
16	Asford, Middlesex—Engine	Managers of West London School District	F. G. Beeching, Clerk to Managers, Ashford, Middlesex.
19	Seacombe, Cheshire—Repairs to Landing Stage	Wallasey Urban District Council	Wood & Fowler, 3 Cook Street, Liverpool.
19	Manchester—Pumping Engines	Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
April 21	Almeria, Spain—Steel Pier	Alqui Mines and Railway Co., Ltd.	Formans & McCall, 130 Hope Street, Glasgow.
" 21	Ash, near Sandwich—Alterations to Swge. Dispos. Wks.	Eastrey Rural District Council	F. H. Anson, 15 Dean's Yard, Westminster.
" 21	Basingstoke—Well, &c.	Town Council	G. Fitton, Waterworks Manager, Town Hall, Basingstoke.
" 22	Burton-on-Trent—Tramways	Corporation	Borough Engineer, Town Hall, Burton-on-Trent.
" 22	London—Reconstructing Bridge over Regent's Canal	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 22	London, S.W.—Electrical Cables	London County Council	County Hall, Spring Gardens, S.W.
" 22	London, N.—Refuse-Destructor Plant	Tottenham Urban District Council	W. H. Prescott, 712 High Road, Tottenham, N.
" 22	London, E.C.—Engines, &c.	Bombay, Baroda & Central India Rly. Co.	T. W. Wood, Gloucester House, Bishopsgate Street Without, E.C.
" 22	Rotherhithe—Camp Sheet & Timber Grid at Wharf	London County Council	Chief Engineer's Department, County Hall, Spring Gardens, S.W.
" 23	London, W.—Switchboards	Central Electric Supply Co., Ltd.	General Manager, 19 Carnaby Street, Golden Square, W.
" 23	Rotherham—Tramways	Corporation	H. H. Copnall, Town Clerk, Rotherham.
" 24	Rathmines, Ireland—Engine-House Plant, &c. .. .	District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 25	West Hartlepool—Sewerage Works	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
" 26	Hull—Pumping Machinery	Corporation	F. J. Bancroft, City Engineer, Alfred Gelder Street, Hull.
" 28	George Town, Penang—Electrical Plant	Municipal Commissioners	Preece & Carlew, 8 Queen Anne's Gate, Westminster, S.W.
" 28	Bexley Heath, Kent—Tramway Requisites .. .	Electric Lighting & Traction Committee	Morley & Dawbarn, 82 Victoria Street, Westminster, S.W.
" 30	Hull—Two Floating Pontoon Docks	North-Eastern Railway Co.	T. M. Newell, Engineer, Dock Office, Hull.
" 30	Trowbridge—Electric Lighting	Urban District Council	T. S. Hill, Clerk, Council Offices, Town Hall, Trowbridge.
May 1	Rathmines, Ireland—Engine-house Plant, &c. .. .	District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 7	Sydney, N.S.W.—Electrical Plant, &c.	Municipal Council	Preece & Carlew, 8 Queen Anne's Gate, Westminster, S.W.
June 30	Sydney, N.S.W.—Bridge across Harbour		Under-Secretary for Public Works, Sydney.
IRON AND STEEL:			
April 10	Bingley, Yorks—Cast-iron Water-Pipes, &c. .. .	Urban District Council	H. Bottomley, Surveyor, Town Hall, Bingley.
" 10	Chester—Cast-iron Pipes, &c.	United Gas Co.	J. O. Belton, Company's Engineer, Gasworks, Road 30, Chester.
" 10	Leeds—Water Main	Corporation	City Engineer, Town Hall, Leeds.
" 12	Nuneaton—Castings, &c.	Urban District Council	J. S. Pickering, Surveyor, Council Offices, Nuneaton.
" 12	Epsom—Sewerage Ironwork, Tools, &c.	Urban District Council	E. R. Capon, Surveyor, Bromley Hurst, Church Street, Epsom.
" 14	Edinburgh—Cast-iron Pipes, Castings, &c. .. .	Gas Commissioners	Chief Engineer, Gas Works, New Street, Edinburgh.
" 14	Coventry—Steel Girders, &c.	General Works Committee	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 14	Glasgow—Tiebars	Corporation	J. Young, 88 Renfield Street, Glasgow.
" 14	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
" 15	Christiana—Tools, &c.	State Railways	Commercial Department, Foreign Offices, S.W.
" 16	Gainsborough—Manhole Covers, &c.	Urban District Council	Surveyor, Town Hall, Gainsborough.
" 19	Old Trafford, Manchester—Steelwork for Public Baths	Stratford Urban District Council ..	E. Woodhouse, Architect, 88 Mosley Street, Manchester.
" 21	London N.—Electric Stores, &c.	Hornsey Urban District Council ..	E. J. Lovegrove, Council Offices, Southwood Lane, Highgate, N.
" 22	West Ham, E.—Wrought-iron Railing	Corporation	Borough Engineer, Town Hall, West Ham, E.
" 23	Calcutta—Stopcocks	Corporation	F. Gainsford, Secretary, Corporation Office, Calcutta.
PAINTING AND PLUMBING:			
April 10	Leavesden, Herts—Cleaning and Painting Infirmary ..	St. Pancras Guardians	W. G. Benton, Superintendent, Leavesden Schools, Herts.
" 12	Macclesfield—Painting two Gasholders	Gas Company	Mr. Newbigging, Engineer, Gasworks, Macclesfield.
" 14	Edinburgh—Oils and Paints	Gas Commissioners	Chief Engineer, Gasworks, New Street, Edinburgh.
ROADS AND CARTAGE:			
April 10	London, S.E.—Repairing Roads, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 10	Harwich, Essex—Paving	Town Council	H. Ditcham, Borough Surveyor, Harwich.
" 10	Oakham—Materials, &c.	Rutland County Council	B. A. Adam, Clerk, Oakham.
" 11	Cradley Heath—Forming, &c., Road	Rowley Regis Urban District Council	D. Wright, Council Office, Lawrence Lane, Old Hill, Cradley Heath.
" 11	Hoyland, near Barnsley—Materials	Urban District Council	W. P. Young, Surveyor, Town Hall, Hoyland.
" 11	Preston—Road Works	Corporation	Borough Surveyor, Town Hall, Preston.
" 11	Preston—Paving, &c.	Corporation	Borough Surveyor, Town Hall, Preston.
" 12	Kiveton Park, Sheffield—Slag	Rural District Council	J. P. Evans, Surveyor, Council Offices, Kiveton Park Stn., Sheffield.
" 12	Epsom—Stores and Materials	Urban District Council	E. R. Capon, Surveyor, Bromley Hurst, Church Street, Epsom.
" 12	Nuneaton—Team Labour, Granite Chipping, &c. ..	Urban District Council	J. S. Pickering, Surveyor, Council Offices, Nuneaton.
" 14	Bexhill—Stone	Urban District Council	G. Ball, Surveyor, Town Hall, Bexhill.
" 14	Bexhill—Making-up Roads	Urban District Council	G. Bell, Surveyor, Town Hall, Bexhill.
" 14	Coventry—Granite Setts	General Works Committee	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 14	Dartford—Wood Paving	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 14	Sudbury, Suffolk—Granite	West Suffolk County Council	A. A. Hunt, County Surveyor, Sudbury.
" 14	Midsomer Norton—Road Materials, &c.	Urban District Council	Surveyor, Council Office, Market Hall, Midsomer Norton.
" 16	Hambleton, Guildford—Materials, &c.	Rural District Council	G. Lintott, Council's Surveyor, Cranleigh.
April 15	London, S.W.—Forming New Roads		W. G. Ingram, 44 Theobald's Road, Bedford Row, W.C.
" 16	Gainsborough—Stores and Materials	Urban District Council	Surveyor, Town Hall, Gainsborough.
" 18	Cromer—Road-making	Urban District Council	A. F. Scott, Council's Surveyor, Church Street, Cromer.
" 21	Kent—Maintenance and Repair of Roads	County Council	F. W. Ruck, 28 Week Street, Maidstone.
" 21	Stevenage, Herts—Granite	Urban District Council	W. O. Times, Clerk, Council Offices, Stevenage.
" 30	Harrogate—Asphalting	St. Mary's Burial Board	H. Horner, 9 Royal Parade, Harrogate.
SANITARY:			
April 10	Wilmslow—Sewer, &c.	Urban District Council	A. S. Cartwright, Surveyor, Council Offices, Wilmslow.
" 12	Bathgate, Scotland—Sewage-Disposal Works .. .	Town Council	P. C. Hart, 134 St. Vincent Street, Glasgow.
" 12	Nuneaton—Earthenware Pipes, &c.	Urban District Council	J. S. Pickering, Surveyor, Council Offices, Nuneaton.
" 12	Bonnyrigg, Scotland—Scavenging	Town Council	J. G. Forbes, Town Clerk, Bonnyrigg.
" 12	Epsom—Disinfectants, Lime, Stoneware Pipes, &c. .	Urban District Council	E. R. Capon, Surveyor, Bromley Hurst, Church Street, Epsom.
" 15	Bryn, Wales—Sewer	Morgan Urban District Council ..	J. Cox, Surveyor, Port Talbot.
" 16	Tarporley, Cheshire—Sewers	Urban District Council	B. Latnam, Parliament Mansions, Victoria Street, Westminster.
" 16	Blaby, Leics—Sewerage Works	Rural District Council	J. Turner, Surveyor, Saffron Lane, Glen Parva, near Leicester.
" 16	Gainsborough—Sanitary Stoneware Pipes, &c. .. .	Urban District Council	Surveyor, Town Hall, Gainsborough.
" 18	Leyton, Essex—Sewer	Urban District Council	W. Dawson, Town Hall, Leyton.
" 19	Marple, near Stockport—Sewers, &c.	Urban District Council	H. Bancroft & Son, 88 Mosley Street, Manchester.
" 21	Ash, nr. Sandwich—Alterations, Sewage Disposal Wks.	Eastrey Rural District Council	F. H. Anson, 15 Dean's Yard, Westminster.
" 22	Biggleswade, Beds—Sewerage Works	Rural District Council	Surveyor, Council Office, Biggleswade.
" 23	Kingsbury, Middlesex—Sewerage Works	Kingsbury Urban District Council ..	W. T. Mansfield, Clerk, Council's Offices, Kingsbury Road, N.W.
TIMBER:			
April 11	Edinburgh—Timber	Gas Commissioners	Chief Engineer, Gasworks, New Street, Edinburgh.
" 14	Llanelli—Timber	Harbour Commissioners	Harbour Engineer, Harbour Office, Llanelli.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 21	Coleraine—Twenty-five Workmen's Dwellings .. .	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
" 30	Glasgow—Branch Library (Local Architects) .. .	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 1	York—Queen Victoria Memorial	£50.	W. H. Andrew, Town Clerk, Guildhall, York.
" 1	Mexborough, near Rotherham—Accident Hospital ..	£35 £10.	C. Brampton, Fern Villa, Mexborough.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 1	Knarsborough—Infectious Disease Hospital .. .	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	tion, Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire Brigade Buildings ..	£100, £50 £25.	Borough Engineer, Town Hall, Sunderland.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River ..	—	St. Petersburg Gorodskaja Uprava, St. Petersburg.
No date.	Ikeston—Public Free Library	£50, £25, £12 10s.	H. J. Kilford, Borough Surveyor, Town Hall, Ikeston.

New Companies.

The Arthur Patent Stoker Syndicate, Ltd.

Registered to acquire, work and develop two patents for mechanical stokers. Capital £5,000 in £1 shares. Registered office: 93, Hope Street, Glasgow.

Trafford Stone Co., Ltd.

Registered to acquire from F. J. Davis certain options and the benefits of certain agreements held by him relating to the manufacture of artificial stone, and to carry on the business of artificial stone manufacturers, &c. Capital £3,000 in £1 shares.

J. Fleming & Co., Ltd.

Registered to acquire the business of plumbers, sanitary engineers, &c., carried on at Sedley Place, Oxford Street, W., as John Fleming & Co., and to carry on the business of plumbers, sanitary and hot-water engineers, gasfitters, &c. Capital £3,000 in £1 shares. The first directors are E. J. D. Eason, C. Rogerson and R. Bedford.

John Wainwright & Co., Ltd.

Registered to take over the business of quarrymen, quarry proprietors, stone salesmen, sand and asphalt merchants, tar paviors, contractors, &c., carried on at Shepton Mallet and elsewhere as John Wainwright & Co. Capital £23,000 in £1 shares. The first directors are J. C. R. Wainwright, J. P. Luff and J. Laver. Registered office: Ham. Wood, Shepton Mallet, Somerset.

Celtic Acetylene Illuminating and General Engineering Co., Ltd.

Registered to acquire the undertaking of the Celtic Acetylene Illuminating Co.; and to carry on business as manufacturers of and dealers in acetylene gas generators, &c. Capital £4,000 in £5 shares.

Bilton Grange Estate Co., Ltd.

Registered to acquire a certain estate at Harrogate, Yorkshire, known as the Bilton Grange Estate, and to acquire and turn to account any building estates and other lands; to erect houses and shops; as builders and contractors; plumbers, carpenters, brick and stone merchants, &c. Capital £1,000 in 1s. shares.

Dewhurst's Engineering Co., Ltd.

Registered to acquire the business of mechanical and electrical engineers, colliery and general mill furnishers, carried on by the executors of the late M. Hunter, trading as John Dewhurst & Son, at Attercliffe Road, Sheffield, and to carry on the business of an electric light company, mechanical engineers, ironfounders, tool makers, brassfounders, metal workers, colliery and mill furnishers, &c. Capital £10,000 in £1 shares. The first directors are J. H. Dewhurst and B. J. Davy (managing director and assistant manager respectively).

T. G. Woof, Ltd.

Registered to acquire the business of T. G. Woof, cabinet-maker and upholsterer, as carried on at Devonshire House, Devonshire Street, Sheffield; to develop the same, and as general house furnishers, shop, office and bank fitters, as plumbers, sanitary engineers, dealers in gas and electric fittings, house decorators, &c. Capital £5,000 in £1 shares. The directors are D. Chatters and J. W. Squire, both of Sheffield.

Refuse Destructors, Ltd.

Registered to acquire certain inventions in relation to improvements in refuse destroyers, furnaces, &c. Capital £10,000 in £1 shares (4,000 "A" and 6,000 "B" shares). The first directors are W. H. Key, E. L. Pinching and F. Davies.

Colwell Whinstone Co., Ltd.

Registered to acquire the undertaking of the Colwell Whinstone Co., and to make marketable stone, clay and other minerals and substances, to acquire mines, mining rights in Northumberland and Durham or elsewhere in the United Kingdom, and to carry on the business of stone quarriers, quarry owners, miners, &c. Capital £3,000 in £1 shares. The first directors are J. Elrick (chairman and managing director), W. C. Reid, J. J. Swan and H. Reid.

Miskin Cottage Co., Ltd.

Registered to acquire any lands and estates in the United Kingdom, and to carry on the business of builders and contractors, auctioneers and surveyors, dealers in building material, hardware, general engineers, &c. Capital £3,000 in £20 shares. The first directors are T. Netherway, G. T. Williams, H. Eyron, D. Harris and I. George. Registered office: Ffowd Offices, Mountain Ash.

Universal Purification and Development Syndicate, Ltd.

Registered to acquire an invention for which provisional protection for the United Kingdom and the Isle of Man, dated October 24th, 1901, and numbered 21,316, has been granted to Robert Malabar for improvements in and connected with the purification of sewage or other foul or impure liquids, and to develop, work and turn to account the same. Capital £3,000 in £1 shares.

W. H. Vickers, Ltd.

Registered to acquire the business of quarry owners and stone merchants as carried on by W. H. Vickers at Quarry Gap, near Bradford, and at Bramley, Leeds, and at Pudsey; and as brick, pipe, tile and terra-cotta merchants, marble masons, slate merchants, colliery owners, coal, lime, sand and coke merchants, builders and contractors, &c. Capital £6,000 in 3,000 £1 preference and 300 £10 ordinary shares. The directors are W. H. and J. F. Vickers (managing directors). Registered office: Oakdene, Stanningley, Leeds.

W. K. Price & Co., Ltd.

Registered to carry on business as brick manufacturers and lime and sand merchants; to deal in and with iron, coal, lime and ironstone, fire-clay, brick-earth, &c. Capital £6,000 in £1 shares. Registered office: Moxley Brick, Sand and Lime Works, Moxley, Wednesbury.

Stych and Rosenthal, Ltd.

Registered to acquire the business of J. Stych & Co. Ltd., as carried on at Bristol and Bath, and to carry on business as manufacturers of incandescent gas fittings, &c. Capital £1,000 in £1 shares. The directors are F. H. Awdrey and A. Rosenthal. Registered office: 8, Bath Street, Bristol.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CAERPHILLY (WALES).—For the construction of settling and straining sewage tanks, main and subsidiary stoneware pipe carriers, and laying-out the necessary land for filtration, together with all incidental works at the sewage farm, Gwaunfryn, near Caerphilly, for the Caerphilly Urban District Council. Mr. Alfred O. Harpur, engineer and surveyor:—
J. H. James, 13 Kimerig Street, Cardiff ... £4,524 0 0
E. H. Page, Castle Street, Cardiff ... 3,670 11 0
G. Rutter, Romilly Chambers, Barry ... 3,581 5 7
A. J. Rossiter, Castle Street, Caerphilly ... 3,304 0 0
[Engineer's estimate, £3,500.]
* Accepted.

CROYDON.—For the erection of detached house, Chatsworth Road, Mr. A. Broad, architect, 22 George Street, Croydon. Quantities by the architect:—
S. Hart ... £1,107
S. Page ... 1,885
Smith & Sons ... 1,960
Akers & Co. ... 1,937
W. Potter ... 1,919
D. W. Barker ... 1,809
Pearson & Co. ... £1,875
E. J. Saunders ... 1,800
E. J. Burnard ... 1,750
Hanscomb & Smith ... 1,744
Smith & Son ... 1,728
* Accepted.

DEVONPORT.—For the erection of workmen's dwellings in Ordance Street, for the Town Council. Mr. J. F. Burns, borough surveyor:—
A. J. Jewell, Devonport ... £22,508 15 3
Allen & Tozer, Devonport ... 19,443 0 0
Pearce Bros., Plymouth ... 19,379 0 0
W. E. Blake, Plymouth ... 18,300 0 0
W. T. Jenkin, Plymouth ... 18,654 19 3
T. May, Plymouth ... 18,498 0 0
Steer & Pearce, Plymouth ... 17,937 4 9
S. Roberts, Plymouth ... 17,827 6 1
A. N. Coles, Valletort Building Yard, Stonehouse, Devon ... 17,520 0 0
* Accepted.

LONDON.—For sanitary and drainage works at the Chequer Street School, Bunhill Row, St. Luke's, for the London School Board:—
G. Neal ... £2,137
Sanitary Lining and Pipe Bending Company, Limited ... 2,104
L. H. and R. Roberts ... 2,068
Johnson & Co. ... 2,051
G. S. S. Williams & Son ... £1,908
J. Peattie ... 1,966
J. Wilmott & Sons ... 1,960
Stevens Bros. ... 1,949
Ashby & Horner ... 1,943
F. Bull ... 1,859
* Recommended for acceptance.

LONDON, E.—For the erection of five shops with dwelling-house over, and conversion of four existing houses and shops, at Grove Road, Mile End, for Messrs. Cohen and Berkovsky. Messrs. H. S. and C. A. Legg, architects, 13 Grafton Street, Mile End. Quantities by Mr. W. Hawker:—
F. & F. J. Wood ... £4,350 0 0
Jackson ... 4,010 10 0
J. & H. Cocks ... 3,961 0 0
Kendall ... 3,924 0 0
Yales ... 3,520 0 0
Barker ... 3,175 0 0

LONDON, N.—For alterations at Holloway Police Station. Mr. Dixon Butler, architect:—

	Credit.
C. Ansell	£2,929
Grover & Son	£10
Clark & Bracey	3,193
J. Parker	3,200
Lathey Bros.	3,239
F. & H. F. Higgs	3,242
Holloway Bros.	3,246
Lasselles & Co.	3,250
Higgs & Hill	3,254
Allen & Son	3,298
Willmott & Sons	3,491

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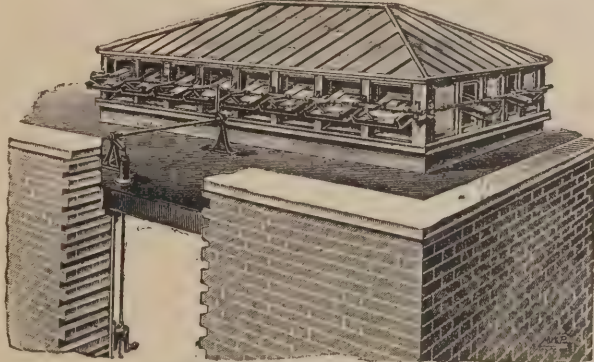
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LONDON, S.E.—For the erection of a parsonage house, Short Street, New Cut, Southwark, for the Rev. G. Robinson Lees, Mr. Ernest E. Fetch, architect, 20 John Street, Adelphi, W.C. Quantities by Mr. J. Jellis:—

H. S. Lee	£1,804 8 6
C. Cole	1,792 11 10
Clarke and Manooch	1,753 8 0
Gregar & Son	1,685 0 0
Godson & Sons	1,685 0 0
Adams & Sons	1,685 0 0
Burman & Son	1,611 0 0
Snewin Bros. & Co.	1,603 0 0
Jerrard & Sons	1,524 0 0
J. W. Jerram	1,444 0 6

LONDON W.C.—For the execution of the following works for three years from April 1, for the Holborn Borough Council: (1) removal of all slop and street sweepings and snow from the several streets in the borough, the cartage of soil raised from the sewers and gullies, the removal of manure, and the hire of horses and drivers for use in the street-sweeping machines; (2) watering and washing of the several streets in the borough; (3) removal of dust and refuse from the houses of the inhabitants. Mr. George Wallace, borough surveyor:—

H. Boyer	£52,305	H. Covington	£50,400
W. Boyer & Sons	51,725	W. Clarkson	52,000
H. Crane	52,000	G. Cookson, Tinworth	
J. Walker	40,800	Street, Albert Embankment, S.E.	47,400
C. Murrell	50,100		

LOUGHBOROUGH (LEICS).—For taking down and rebuilding property in High Street and the Market Place, Loughborough, for Mr. H. F. Young, Mr. A. E. King, architect, Baxter Gate, Loughborough:—

Brown & Son, Leicester	£3,280
A. B. Clarke & Nottingham	3,245
Ford & Co., Osmaston Road, Derby	3,110
E. Orton, E. Lillistown	3,055
W. F. Harding, Sparrow Hill, Loughborough	3,070
T. Barker & Son, Swan Street, Loughborough	3,070
A. Faulks, Sparrow Hill, Loughborough	2,950
J. Hutchinson & Son, Nottingham	2,800

LYDIARD MILLICENT.—For the erection of a detached house at Lydiard Millicent, near Swindon, for Mrs. E. Akers, Messrs. William Drew, M.S.A., & Sons, architects, Regent Circus, Swindon:—

Tydemann Bros.	£540 0
Flewelling & Hucksion	495 0
A. J. Colborne	354 10
J. Ponting	345 12
J. Williams	337 0

MERTHYR CYNOG.—Accepted for the erection of vicarage. Glendinning Moxham, architect, Swansea:—

R. L. Williams	£989
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OXFORD.—For the erection of a detached house for Alderman Buckell, J.P., at the corner of Staverton and Woodstock Roads, Oxford. Mr. Herbert Quinton, architect and surveyor, 22 George Street, Oxford:—

Kingalee & Sons	£2,707
Money & Wild	2,638
N. Capel	2,570
J. Woodbridge	2,410

ST. MARKS WYKE (SURREY).—Accepted for the erection of vicarage at St. Marks Wyke, Surrey. Glendinning Moxham, architect, Swansea:—

Henry Billings	£1,812
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WEYBRIDGE.—For the erection of National Schools. Mr. A. H. Ryan-Tenison, A.R.I.B.A., architect, 12 Little College Street, Westminster, S.W. Quantities by Mr. E. R. Babbs, Westminster, S.W.:—

Schools and Playground.	Master's House.	Total.
Palmer, Dulwich	£4,722 5 0	£1,226 0 0
John Barker & Co., Kensington	4,523 0 0	983 0 0
A. & H. Quibell, Haringey, N.	4,534 0 0	1,017 0 0
H. P. Hill, Weybridge	4,082 16 0	959 17 0
Potterton, East Molesey	4,014 15 0	993 10 0
Turtle & Appleton, Battersea	3,880 0 0	1,060 0 0
H. Somerford & Son, Clapham, S.W., and Orpington, Kent	3,965 0 0	892 0 0
Nightingale, Albert Embankment	3,771 0 0	1,003 0 0
Mitchell Bros., Guildford	3,849 10 0	873 0 0
C. Horsell, Weybridge	3,575 10 11	594 10 11
Gathercole Bros., Norbury, Surrey	3,064 0 0	900 0 0
Stanley Ellis, Guildford	3,604 0 0	916 0 0
W. Smith & Son, Croydon	3,583 0 0	885 0 0
Vigor & Co., Fimble	3,443 0 0	967 0 0
William H. Gaze & Son, Wotton, Thames	3,530 0 0	883 0 0
Edmund Chamberlain, Addlestone, Surrey	3,367 10 0	859 0 0
Higby & Robson, Thames Ditton	3,370 9 0	850 0 0
Newland & Higgs, Street Cobham, Surrey	3,373 0 0	835 0 0
Hammond, Battersea		
Haslemere Builders, Haslemere, Surrey		
J. W. Young		

SEVENOAKS.—For works in St. Botolph's Road:—	
G. Oulton, Westerham	£4,447 3 6
C. Peerless Dennis & Co., Eastbourne	4,344 19 4
T. Free & Sons, Maidenhead	4,318 9 0
T. Adams, Wood Green, N.	4,209 6 4
J. Jackson, Plaistow	4,011 5 7
G. Bell, Tottenham, N.	3,948 0 0
Lawrence & Thacker, Clapham Common, S.W.	3,892 3 4
E. Iles, jun., Wimbledon	3,822 14 1
T. Philbrick, Leicester	3,512 9 4

[Surveyor's estimate, £3,887 13s. 9d.]

SWANSEA.—For alterations, &c. to 2 Giamor Crescent, Swansea. Glendinning Moxham, architect:—

J. & F. Weaver	£235 0
Bennett Bros.	815 0
Henry Billings	808 15
John Davies	808 15

SWANSEA.—Accepted for alterations to the "Bungalow," Sketty. Glendinning Moxham, architect:—

Walters & John	£564
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SWANSEA.—Accepted for completion of shops and premises, High Street. Glendinning Moxham, architect:—

Benjamin Lewis	£1,028
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SWANSEA.—For the erection of a pair of cottages, Skewen North Swansea. Glendinning Moxham, architect:—

J. Goodridge & Son	£560
Walters & John	536

SWANSEA.—Accepted for the erection of a pair of villas, Sketty, North Swansea. Glendinning Moxham, architect:—

J. & F. Weaver	£1,200
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SWANSEA.—For alterations and additions to Swansea Hospital. Glendinning Moxham, architect:—

Walters & John	£2,903 0 0
J. & F. Weaver	2,801 0 0
T. Richards	2,850 0 0
J. Marles & Son	2,850 0 0
Bennett Bros.	2,835 0 0
J. Goodridge & Son	2,830 0 0
Griff Davies	2,790 0 0
Thomas, Watkins & Co.	2,669 3 4
J. Davies	2,655 0 0
W. Davies & Co.	2,486 4 0
H. Billings	2,429 0 0

SWINDON.—For road-making, sewerage, &c., continuation of Redcliffe Street, Swindon, for Messrs. John Groves & Sons, Ltd. Messrs. Wm. Drew, M.S.A., & Sons, surveyors, Swindon:—

J. Williams, Swindon	£224 7
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SWINDON.—For the erection of a bowling alley at the New Century Workmen's Club, Bright Street, Gorse Hill, for Mr. Howard Horsell. Messrs. William Drew, M.S.A., & Sons, architects, Regent Circus, Swindon:—

W. Blackwell	£218 0 0
Flewelling & Hucksion	239 0 0
J. Williams	251 0 0
L. Lay	240 18 6

THURNSCOPE (near DONCASTER).—For alterations and additions to the sewage and outfall works at Thurnscope, including the construction of four new filters, a caretaker's house, and the laying-out of land for surface irrigation, for the Doncaster Rural

District Council. Mr. J. Simmons, M.I.C.E., engineer, Bank Chambers, Doncaster:—

D. Gill & Son, Doncaster	£2,200 0 0
B. Roberts, Wheatley, Doncaster	2,098 9 6
M. Hall & Sons, Bradford	2,048 15 9
Jones Bros., Barnsley	2,030 0 0
G. Pugh & Sons, Rawmarsh, Rotherham	1,964 10 0
C. Sprakes & Sons, East Laithgate, Doncaster	1,853 0 0
G. H. Burrows, Barnsley	1,668 14 0

WALTON.—For drainage work, Walton-on-Thames, Surrey, Messrs. Foulsham & Herbert Riches, surveyors, 3 Crooked Lane, King William Street, London, E.C., and Bromley-by-Bow, E.:—

E. J. Ingram	£198
G. Gaze & Sons	171
G. Luker & Son	140

B. Ingram & Co. ... Accepted.

WESTCLIFFE-ON-SEA (ESSEX).—For the erection of residence and stabling, &c., Westcliffe-on-Sea. Messrs. Greenhaigh and Brockbank, architects, Bank Chambers, Southend:—

A. Ventris, Great Wakering	£1,080 0
F. & E. Davey, Southend	1,080 0
E. West, Chelmsford	1,000 0
Davis & Leany, Southend-on-Sea	1,870 0
W. E. Davey, Southend-on-Sea	1,792 10
Harris & Rowe, Shoeburyness	1,770 0
W. Stubbs, Southend	1,647 16
J. Band, Chancery Road, Southend-on-Sea	1,503 0
Moss, Southend-on-Sea	1,540 0

WEST HAM.—For the erection of an electric generating station and offices at Quadrant Street, Canning Town, for the Corporation. Mr. J. G. Morley, borough engineer:—

West Bros., Strood	£21,000
Yates & Co., Bow	61,521
Foster Bros., Norwood	59,833
G. Wise, works manager, West Ham	50,773
Leslie & Co., London, W.	38,755
Shillitoe & Son, Bury St. Edmunds	37,000
F. G. Minter, Westminster	55,494
Johnson & Son, Leicester	55,818
Gregg & Son, Jupp Road, Stratford	53,090
Thomas & Edge, Woolwich	33,995

WYKE (near BRADFORD).—Accepted for additions to Books' Mou-t, Wyke, near Bradford. Messrs. Fairbank & Wall, architects, Bradford:—

Mason, J. Brook, Wyke	£270 0
Joiner, Harry Gough, Lightcliffe	393 10
Plumber, C. Candelat, Brighouse	254 0
Plasterer, W. Jagger, Wyke	165 0
Slater, James Smithies, Brighouse	75 0
Painter, W. Jagger, Wyke	37 10

£1,635 0

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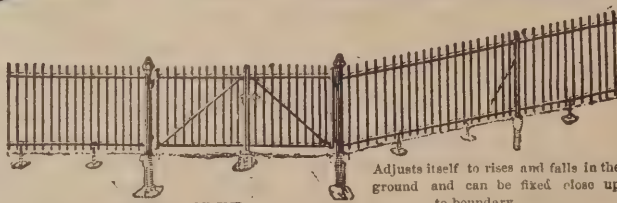
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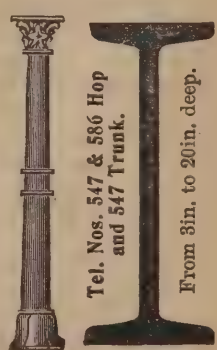
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An Architectural Causerie.

Nest Architecture. THE birds have now built their nests and they have done so in the same way as when man lived in caves, and before he had the intelligence to build for himself. A bird's nest offers the most interesting problem, for while some call it architecture, others (including Viollet-le-Duc) call it construction, though one of the strictest tenets of the modern critic is that architecture is good construction, in contradistinction to the definition that it is the art of building according to principles of beauty and harmony in addition to those of pure utility. However, this quibble of words never results in anything definite and consequently it is useless to continue the wrangle. It is both well and opportune, however, to consider the construction of nests with the view, not of acquiring any new principles, but of appreciating the wonderful intelligence they display. Some are comparatively coarse, like the rook's which sways to and fro on the branches of an elm, while others, like the titmouse's, are a microcosm of care and dexterity: some are hollowed out in living trees, some are dome-covered (like the wren's), some clay-built, some swung hammock-wise, some suspended by a single cord, and some stuck together with a secretive resembling glue. In each case there is an example of construction worthy of our attention, and while the reasons for most of the features are at once obvious, there are others which are only discovered after a close examination; such, for example, as the counterpoise of earth which is added to balance the increasing weight of the growing young birds, which, in their time, through inherited habit and imitation, will build as their parents did. As Ruskin says: "It cannot be imagined that either the back streets of our manufacturing towns, or the designs of our suburban villas, are things which the angels desire to look into; but we should at least possess as much unconscious art as the lower brutes, and build nests which shall be, for ourselves, entirely convenient, and which may perhaps in the eyes of superior beings appear more beautiful than to our own."

Streets of the Future. It is estimated that London has nearly two thousand miles of streets: Islington alone has 120 miles, while Lambeth includes 140 miles of streets; and the task is to keep them clean. In

most districts horse-brooms, water-carts and gangs of scavengers are turned out in the early hours of the morning to remove the dirt, and it is only the City that really washes down its streets with a hose pipe; but there can be no doubt that the latter is the better method. It has been stated that the cost of washing Oxford Street by water-vans is 9d. per 100 yds. super. and that of washing the Strand by hose 3½d.,

as a living thing, now adds to our streets, yet the insanitary condition into which he reduces them will be done away with when all traffic is carried on by automobiles; and one of the primary requirements of a city is that it shall be as thoroughly sanitary as possible. Moreover, there is the financial side of the question. At present the wear and tear in streets is almost entirely due to the pounding of horses' hoofs,



DAIRY AND FLATS, GREAT MARYLEBONE STREET, LONDON, W.
SAUL AND HARDY, ARCHITECTS.

though considerably more water was used by the hose. In neither of these streets, however, is there any asphalt, and the difference between their condition and that of the City streets is very great. Asphalt is indeed the material of which all the streets of the future will be made, for it provides the ideal surface for motor-cars, and nobody observant of the times can fail to see that these must inevitably supersede the horse in cities. Nothing is an unmixed blessing, and though we shall lose the charm which the horse,

which so breaks up the surface that the sewers are charged with wood fibre which decomposes very slowly and is extremely difficult to get rid of; so that when the pleasant motor-car arrives—not the crude, undeveloped, nerve-racking creation of the present, but the perfected, quiet, non-smelling motor-car of the future—the authorities will be free of the great expense of keeping their streets in repair and of maintaining a huge body of men and machines for cleansing them.

RECENT STREET ARCHITECTURE IN LONDON.—II.

BY F. HERBERT MANSFORD.

(Continued from p. 3, No. 367.)

SINCE Inigo Jones erected an Italian arcaded piazza in Covent Garden, London has been adorned and marred by other architectural importations. We have an American skyscraper at Queen Anne's Gate, Continental hotels in Northumberland Avenue, and the covered side pavements of Australia at Brixton. Now we witness an attempt to introduce the principle of the Chester "Rows" into Shaftesbury Avenue. A large triangular block has been completed at the north end with a row of shops on the first floor sufficiently set back to permit a covered terrace or pavement to be provided in front, approached by stairs at convenient points. It will be remembered that Sir Frederick Bramwell advocated this arrangement for the Holborn to Strand street; its failure here on an isolated block would not necessarily prove its ineptitude if carried out in a series. The choice of materials for this interesting experiment was not a happy one. Stout granite columns bearing exposed iron girders would have been more satisfying to the eye than the existing terra-cotta casings to slender iron stanchions and joists. But it is not, perhaps, reasonable to suggest a less fireproof construction. Above are a series of flats, presumably by the same designer as others in Cavendish Square and St. James's Street. The same hardness of detail and partiality for battlements and meagre Tudor chimneys characterises both. The sheltered terrace forms a promenade for the occupants of the flats, so that the shopkeepers will not depend entirely upon the willingness of the general public to mount flights of stairs, and the children will have a dry walk in all weathers.

Messrs. Novello & Co.'s printing premises in Hollen Street, Wardour Street, form a substantial block of red brick, relieved by two carved friezes. The sculptor has courageously introduced a modern printing-press among the naked amorini with a success that makes one regret the narrowness of the thoroughfare, which precludes proper examination.

Tall chimney construction is an entirely modern architectural development, although, perhaps, one should scarcely say "architectural," for these stalks are frequently outside the architect's domain, as witness that of the Electric Power Station at Chiswick, which consists of 260ft. of metal tubing standing on end. Tall chimneys are becoming common features of our streets, and of late they have increased more rapidly than church towers and spires. If the architect who has the chance of designing one is free from Classic or Mediaeval precedent he is, however, closely bound by the London Building Act, which, while nominally only limiting the thickness of walls and fireproof lining, determines very nearly the outline itself. That is to say, given the size of aperture at the top (dictated by boiler-makers) and the thickness of walling, very little variation of outline can be made without extravagance of material. "Mangia," the tower of the municipal palace at Siena, has been taken as a model for more than one tall London chimney; the East London Water Company have erected several chimneys of another campanile type, but recently the octagonal plan has found favour, and this seems to have rendered Italian models less persistent in the minds of the designers. The tall chimneys which have been built north of Golden Square give an interest to the rather squalid streets which they dominate. They have a worthy rival in the square stalk by St. Anselm's Church, Davies Street (illustrated on the opposite page).



PAGANI'S RESTAURANT, GREAT PORTLAND STREET, W.
PROFESSOR BERESFORD PITE, ARCHITECT.



DETAIL OF PAGANI'S RESTAURANT.

In Oxford Street the most recent buildings are commonplace, but expectancy of something better naturally arises in connection with the clearance for Messrs. Waring & Co.'s new premises opposite the Pantheon. The timber staging is certainly one of the most pleasing examples of the current taste for decorative hoardings and scaffolds.

A considerable amount of rebuilding is taking place in the neighbourhood of the Middlesex Hospital, tenement houses giving place to flats. A few of these display more or less successful experiments in the combined use of bricks and cements of various colours. In Langham Street is a nursing home faced entirely with white and black glazed bricks, but salt-glazed or blue Staffordshires are chiefly employed for the lower storeys and red or yellow facings above, with coloured cement panels, stonework being confined to the doorways and copings.

Italian restaurants in London frequently attempt some reminiscence of the South, generally through the medium of paint. Some years ago a pleasing terra-cotta façade near Tottenham Circus, on coming into possession of Italian restaurateurs, was coloured to imitate marbles. Pagani, however, in Great Portland Street, have set a better example. A dull-glazed faience façade was erected about two years ago, and quite recently Professor Beresford Pite has extended the treatment and also spread a veneer of tile mosaic over the upper portion of the premises, capping it with a deep-coved eaves and slate roof. The strangeness of the work may provoke disapproval at first, but a growing acquaintance will probably arouse a less biased judgment and qualified approbation. It is necessary to bear in mind that it is of two dates and by two designers. The colours of the faience are pleasing; the modelled insertions of Pomona, Ceres, &c., have not the garishness usually associated with Della Robbia ware and which might be out of place in London. The details of the niches between the first-floor arches show

the refinement we expect from Professor Pite and satisfy the eye even while empty. But the freedom of the mosaic above, the swirl of it, the partial disregard of the architectural lines of the windows, may not equally commend themselves. Perhaps the architect himself regards the work as somewhat in the nature of an experiment. However, Great Portland Street has been enlivened by something expressive and original, and one feels grateful.

On the west side of Princes Street, Cavendish Square, is an interesting example of close union between sculptor and architect. The two bays which form the principal features of the elevation are upheld by crouching figures. The modelling is scarcely equal to the design, lacking somewhat in fullness and strength, but the general effect is pleasing.

On the Portland estate the end house of a row generally had stabling attached with a frontage to the side street. In several cases these stables have given place to houses of varied design, but governed by the general condition of respect for ancient lights. As a result, the vistas of the streets west of Portland Place are now enlivened by low red-brick houses with tiled or green-slatted roofs.

In Great Marylebone Street some new dairy premises have afforded the architects a favourable opportunity for design. Favourable, because a dairy does not demand an excessive display of plate glass and because the new façade terminates the vista southwards of Westmoreland Street. Messrs. Saul & Hardy have availed themselves to the full of these advantages and produced an elevation appropriate and distinctive. A pleasing shop-front is enclosed by a wide three-centred arch with a projecting stone hood. Above this are carved some poultry, slightly modelled, but thrown into strong relief by the deep sinking of the ground, an effect being produced analogous to that of fretwork. Above, the six bay windows of the flats are reposeful by their similarity and by the amount of undisturbed wall-surface on either side. The cornice is bold and effective, and in the gable above we see that a semicircular-headed window can be satisfactorily divided by a single mullion if the line of it is led up to or continued by the treatment of the wall-surface. It is understood that the premises on either side will shortly be rebuilt and that the architects will accept Messrs. Saul & Hardy's design as a centre and carry on a harmonious treatment to the right and left.

Near by, in the High Street, Marylebone, some butcher's premises are rendered attractive both by excellences of detail and by careful selection and juxtaposition of the materials employed—Norwegian felspar, unpolished grey granite, purple and bright red bricks.

In the Marylebone Road is Harley House, a block of flats designed on an ampler scale and in a more generous manner than usual. The old trees have been preserved and a carriage-drive formed on the 50ft. of land which still survives in front of most of the houses in this thoroughfare. The two principal elevations are faced with stone; and although the heights of different portions vary considerably the whole structure is well knit together by a continuous cornice and its surmounting railing. The angle pavilion has a steep eight-sided roof crowned with a pleasing termination in copper.

There is little recent street architecture of interest in the districts of St. John's Wood and Maida Vale. A block of flats by Professor Pite opposite the burial ground in Paddington Street, the extension of the Christian Union Almshouses in John Street, and a lofty-gabled house on the east side of the Edgware Road show freshness of detail. The neighbourhood of the Harrow Road is monotonous in the extreme, although the church towers and spires apprise the weary traveller of oases in the architectural desert.

(To be continued.)

An Old Font.—The rector of Caister-on-Sea has applied to the Chancellor of Norwich for permission to place in his church an ancient font recently discovered by the rector of Mellis in a cottage garden near Eye, Suffolk. The font is in Decorated style, and was probably fashioned in the sixteenth century. It had done duty as a big flower-pot, weighed nearly a ton, and was valued at £5. Where it came from originally has not been discovered.

STREET ARCHITECTURE.*

By BERESFORD PITE, F.R.I.B.A.

THE street architecture of England can only refer nowadays to the combined effect of the many various and unrelated buildings in our streets. We have no proper street architecture in the sense in which we may be said to have a domestic or ecclesiastical architecture of recognisable quality, possessing admitted characteristics born of tradition and new movement.

A broader description of civil architecture, including within the term buildings of municipal or semi-public character, will not alter materially our estimate or permit us to claim for our towns and cities an architecture of which we could in any general way define as coherent, traditional or worthily characteristic of our national taste and refinement.



CHIMNEY, DAVIES STREET, LONDON, W.

But our street architecture, such as it is, cannot help being representative of its producers and of their ideals or lack of them; and as there is neither lack of enterprise nor of self-esteem among us, particularly in the life of our street-building cities, the consideration of the external environments of this busy side of life may assist us in endeavouring to review the causes and effect of our lack of a street architecture which should rank with that of dwelling-houses and churches, and direct us to some ideals which may stimulate that desire for improvement which would ensue upon the consideration of a condition which we have been led to admit is unsatisfactory.

Comparison with Domestic and Ecclesiastical Architecture.

We have premised that our ecclesiastical and domestic architecture has life and artistic value,

* A paper read before the Applied Art Section of the Society of Arts on April 8th, 1902.

for any review of the art of the Victorian era exhibits a revival from mere formal symmetry and application of types to vital influences of artistic adaptation to purpose and pleasant reflection of the eclectic study of the traditional architecture of England. Education, culture, refinement and literary taste are evident in the whole movement of the building arts and crafts during this period. The churches of the latter half of the nineteenth century, arranged chronologically and illustrated internally and externally, will present a gallery of architectural designs of amazing versatility and originality, and of quite wonderful beauty of picturesque dignity and charm of detail rich in genuine beauty of workmanship and conception.

A similar result will be arrived at with the exercise of some greater selection in the earlier period by assembling an exhibition of English houses of all sizes, the homes indeed of the people of a profound peace and of unparalleled domestic prosperity and development. Stately or modest, romantic or homely, the same originality of conception, wide comfortableness, reasonableness and perception of the beauty of domestic life will be generally apparent, while in the details of decoration and furniture artistic impulse and architectural character have led to a real revival of the handicrafts which endeavours to make the commonest utensils of home life beautiful to eye and hand, ennobling alike the designer and the user.

It may be remarked incidentally that the manifested vitality of this English architecture has met with recognition at the hands of Continental critics, and that in ecclesiastical and domestic art we have an admitted mastery that has produced energetic followers and admirers in different directions.

It must be observed that the two branches of building art upon which we are touching have originated in one class of society, and in very many ways reflect its social conditions and ideals.

The same upper and upper-middle class have provided the examples alike of church and house building, and the movements of thought expressed in this architecture are of the refined education and literary taste—let us say—of those who have derived their ideal and sense of culture from university life and from opportunities of historical study. The breadth of view and freedom of thought, the criticism and eclecticism of the passing day are as present in its architecture as in its literature for all who can read the characters employed in their expression, of which an easy illustration can be offered in the sustained devotion to mediæval tradition both of the architect and of the ecclesiastic. In all the work of this representative class there is the characteristic of a powerful craving for a sense of style, a self-consciousness foreign to real Gothic art, but as current in the buildings as upon the lips of client and architect, and with this a strong personal note of individualism and independence which, by persistent differentiation both of example and type, has made the architect a man who seeks for originality without creative matter and for conformity to style without the opportunity of realising that environment of characteristics upon which completeness of artistic style depends.

The sense of refinement in this architecture has become so much a characteristic quality to be sought for, marked down and expressed, that native simplicity has been replaced by a laborious affectation which has danger in its artificiality, though its note of revolt against the tendency of the world at large to vulgar elaboration of effect is of great value.

Commercial Street Architecture.

As our subject is not the consideration of civil architecture, we exclude public buildings, although they form part of many street perspectives, and, with some reservations, cannot consider at any length the dwelling-house of the modern street—such streets of dwellings usually described as "parks" or "gardens," which might suffer in reputation by a more sincere classification—leaving for our discussion the buildings that compose the business quarters or centres of our cities, which may be safely defined as those of the commercial world—wholesale, retail, warehouse, store and shop, together with their necessary manufacturers', companies' and insurance offices, banks,



SHOPS AND FLATS, SHAFTESBURY AVENUE, LONDON.

and accommodation for the professional men who are essential to business life. It is, therefore, the business community which is mainly responsible for and indeed originates our street architecture, for whose wants it is designed and by whose ideals it is controlled. This commercial class is the backbone of our national life and prosperity, and upon it depends that measure of wealth without which architecture as at present practised could not exist. It has represented until now the pre-eminence of England, and we shall expect to discover in its architecture, if we have time for analysis and search, so much of this part of the secret of England's greatness as is capable of translation into stone and brickwork expression.

Comparing the architecture of the ecclesiastic and of the country gentleman with that of the business man, we would naturally anticipate finding that the predominating tastes of the one are sentimental and of the other practical or unsentimental. Art is so wholly a matter of sentiment—we might almost say it is pure sentiment of high and noble character, and architecture therefore largely, though not wholly, so—that we might, without surprise, discover that the street building of our commercial centres was entirely unsentimental, and architectural only in being wisely and designedly practical.

If we could plant an Utopia where, as a condition precedent of existence, subsistence was provided independently of the exercise or practice of art, we would devoutly wish the consummation that buildings only partaking of sentimental character should be designed by architects, and the streets devoted to unsentimental commercialism and its dependents, erected by mere surveyors. That they would be ideally beautiful architecture in so far as they were soundly built and truly adapted to purpose without the affectation of sentimental art I for my own part sincerely believe. The practical business man, however, takes the world as he finds it and conforms his labours to its requirements, and we, admiring the truly practical when it is practically true, must accept the street architecture of commercial purposes as it is, and suit our labours to its peculiarities.

The world, as observed by the keen eye of commerce, has a love of beauty—that is, of colour, of variety, of ornament. The Manchester print sells better in Africa if gorgeous, and ordinary articles of household use from smallest to greatest sell better if ornamented, just as they sell better if cheap; in fact, it is to be observed that cheaper articles can be obtained having more ornament upon them

than costly ones, cheapness and beauty of the commercial sort going hand in hand, and that which is intrinsically better being extrinsically worse, that it is deemed less worthy of decoration. The commercial world is at present so, its relation to true art anomalous and contradictory, but, we hope, yet under some preliminary pulsations of conscience upon the subject, at all events in the home market, though radically wrong in its conception of art as such. Art exists practically, and it is therefore grasped by the commercial hand, but its character changes in the touch from a pure sentiment to an advertisement, and in this very different aspect we meet it in our street architecture.

Good Design compatible with Requirements.

It may be well before going further to emphasise the necessary doctrine, that good building design—that is, good architecture—is not incompatible with the best adaptation to use, convenience and healthiness of arrangement. No definition of architecture should be allowed that would limit, in the presumed interests of art, for instance, all the access of light that business premises demand either in the size or position of windows. Should it be necessary to have the entire frontage of a building occupied with window surface, so far as the limit of the law allows, an architect would assume an entirely false standpoint should he declare that this purpose is contrary to art, though if he decides it necessary to limit the openings by constructive considerations he would be unquestionably within the sphere of his proper authority. Even architectural proportion—that subtle and almost indefinable quality of adjustment which gives pleasure—is itself based upon factors of service. For example, the apparently good proportions of a column depend upon a recognition of the substance of its material, for a well-proportioned wooden column would almost certainly become unsatisfactory if the same proportions were observed and it was erected of stone or brick. The traditional conventions of proportion in the so-called orders of classic architecture had their origin in the refined adaptation of supports to spaces owing to the necessary limitations of length and depth in the stone lintels which connected the columns. There is nothing radically inimical to satisfactory architectural proportion in any necessary acceptance of the large spaces requisite and recognised as essential for the window surfaces of shops or showrooms in warehouses upon the street fronts of the buildings.

The frank acceptance of the most serviceable and convenient materials for the peculiar requirements of commercial buildings is not under any circumstances to be avoided as inar-

tistic. In a public building of a quasi-monumental character and of varying use stone columns or arcades would have an architectural value and suggestiveness both in their forms and material. Association and tradition have in such cases much to borrow from ancient historic precedents, and a sheer modernism of idea would probably be alien in spirit to the *genius loci* and associations of the building. But in business architecture the converse is more usually the case; the commercial world can only in rare instances maintain ancient forms or style; the movement in trade of all kinds is to the newest and latest style, and the pressure of the time, not only in economy of production but in rapidity of distribution, is felt in every direction.

Use of Iron and Plate Glass Picturesque.

The employment of iron and steel fireproof construction for supports and lintels in the front as well as in the interior, the use of large sheets of plate glass and the carrying of great masses and weights upon narrow steel stanchions are instances of special treatment for which a pedantic architecture will not succeed in discovering conformable types in antiquity, though the same principles of truth, to which pedantry is blind, are to be observed if sought for in all genuine architectural forms. A progressive and living art of building has everything to gain from any new or increased suitability of its materials to the ultimate uses of the building.

We may depend that there is as much honest picturesqueness of true character about a modern warehouse front of rolled iron and plate glass as in the timber-framed construction and leaded-quarried glazings of its ancestor of the Elizabethan period, newly erected for the developing woollen trade of England, and similarly occupying whole surfaces of street frontage with small quarried glazed windows and a multiplicity of subdivisions necessitated by the overhanging construction—a contrivance to increase floor-space upon a limited site.

The advent of the employment of rolled-iron joists into building art, with its later development of complete steel-framed construction, marks an era upon the threshold only of which we now stand. The significance of this new aid to building can be estimated only by reference



LOGGIA TO SHOPS ON FIRST FLOOR.

to the truly astonishing high buildings of the United States. Nothing in architectural history can compare in importance with this development since the re-discovery and application of the dome to buildings of magnitude by Brunelleschi and Michael Angelo at the Renaissance. That sudden and amazing stride into a new domain of construction, when building art appeared to have exhausted its own development, is alike in extent and application to the almost spontaneous generation of high street buildings in America. The purposes and authors of the one class and of the other contrast picturesquely and characteristically enough, the evolution of conscious building art, cultivated by lofty ambition to do service to the universal ecclesiastical State policy of Christendom, on the one hand, and on the other the indomitable persistency of invention stimulated and spurred to all utmost developments by the commercial enterprise of a continent of seemingly exhaustless resources. Compare Michael Angelo with the "Soaring Bird of Freedom"! In the old country, however, the soaring qualities of steel-framed construction are limited by considerations which we need not discuss, for among the disadvantages of living in a city of the old world are to be counted an equitable right to light and air within one's building, and in narrow streets this involves a limitation of nearly every one's right to soar in building materials; and as the general sanitary conditions of the street itself are affected by the preservation of sunshine and air, they have become one of the many cares of "our excellent grandmother."

Architecture of Iron Construction.

Iron and steelwork have, however, entered so fully into the marrow of the building construction of our street architecture that walls, properly so called, are now few, generally the normal pair of party structures only, the remainder consisting of panels of brick or stone material filled into the framings of metal-work, while the floors themselves have in all important premises ceased to be of wood, and are of iron filled in with concrete or terra-cotta. The main problem of all construction—that of the distribution and carrying of weights—is also most profoundly affected by steel construction. The sectional area required in the supports is so limited, and the spans of the bearing girders so great, that the traditional proportions based upon wooden beams and stone arches, which have become almost a second sense of mankind universal, are no longer of any value, and this essential and fundamental factor of constructive proportion should and must reconstruct the visible expression and meaning of the symbols derived from the stone and wooden architecture of the past. These symbols exist in the mouldings, cornices, architraves, capitals, bases, and detail of the architectural ordinances of the various so-called styles. The modern architect must emerge from his museum of paleolithic implements and enter upon the iron age of commercial architecture with a good heart and reliant enterprise. The new factors of proportion are as valid as those that have passed away, and there is the same universal sense of that which is just and true to ensure the appreciation of intellectual motive, which is itself the sense of the beautiful in architecture. The new "half-steel" has exactly the same claim to be interesting first and beautiful afterwards as its exact forerunner the "half-timber," and may and should be studied and applied upon the same principles of expressive characterisation of constructive facts. The rivet heads, stiffeners and knees of framed girder and stanchion work are similar elements to the oak pegs, bracings and bracketings of our charming old English fronts. That has passed away with the sweet forests of Robin Hood; this remains with the black country of the smelting furnace and coal mine, but is as real and more real to us, as true indeed and as noble in service if looked at straightly without the pseudo-medieval squint of a false aestheticism.

Again, the old English frontispieces are charming to us because the glazing is all little pieces connected together by leaden strips, and our modern English warehouses disagreeable and inartistic because the glazing is of the more suitable and perfect material of plate-glass of modern discovery; this is an anachronism which illustrates that conflict between current artistic ideas and common-sense which has had

so malevolent an effect upon our business-house architecture.

The steel joist and stanchion not only have their use, and that the principal one, in the general construction of modern city buildings, but concern our subject mainly in their appearance or, perhaps we should say, non-appearance upon the street front. By their aid the shop window is enabled to extend itself across the whole site, and this advantage the commercial man cannot be induced to sacrifice for any architectural fancy of the necessity of visible support for its superstructure. It does not matter to him what the architect does with the girder so long as he provides unhindered space for the exhibition of wares. Its uses to the builder are many and obvious; it dispenses with arches and their thrusting or weights, it carries these certainly to the points of support; it receives the floor joists easily, and is so rapidly constructed and fixed that the poor architect has to be content and accept it, though he endeavours to satisfy his artistic conscience with delusions by masking the objectionable girder in stonework and resigning all criticism of the lower storey, beginning his own conception above it. But the ironmonger dogs the artist's steps still, and in window lintels and supports asserts remorselessly the value and economy of metal over stone and wood; the wide windows high up to the ceiling and low down to the floor, perforce, must be spanned too by girders, as there is so little room for rising arches or other means of construction, and these again are covered over with more or less delicate stone mouldings attached and pinned to the iron frame in an indescribably unconstructive manner. Few architects have as yet had the courage to think out an iron architecture, say, with glazed brick, terra-cotta, stone or concrete fillings. There have been encouraging experiments, but the mental effort of departure from the well-worn conventions of stonework design is apparently too great for the generality of street-architecture practitioners.

Modernism in Design.

The architect may find some difficulty in adapting his taste to his sense and his sentiments to business judgment, but ere long the sounder ideal of modern common-sense in these matters will be found as enjoyable as that of an old England, which is at the best unreal and imitative and, however charming and possible in the circles of ecclesiastical and domestic art, is inadmissible in the sphere of modern progressive commercial building. The meeting of architectural art and business life will not be found upon any ground of compromise between that which is ancient and modern, or between that which is ideal and practical, but in such a practical employment of modern conditions as will lead the way to further usefulness and appropriateness in building.

A whole-hearted acceptance by architects of the doctrine of a frank modernism of design and construction in business premises is sufficient requirement to make of them for the establishment and growth in our midst of a healthy street architecture, which, expressing the movement of the age in its requirements, will reflect the intellectual attitude of trained and artistic minds applied to a commercial

problem in building. The profitless and stupid antipathy that is supposed, and partially exists, between commercial and artistic character should thus, at all events in architecture, cease to be confessed, and having reformed the attitude of art to business life we can the more sincerely and successfully hope for and attempt the resuscitation, for it once existed in pure and noble beauty, of living art in the commercial world.

The employment of modern materials and the joyful acceptance of current requirements as a means of expressing a progressive architecture will, however, bring the architect into conflict with other ideals than those merely of an archaeological correctness or antique style. Serious problems in design, nearly all as yet practically unsolved, await him when the first and upper floors have to be designed over and upon a lofty ground-floor shop, the front part of which occupies all the clear space between the ends of the bounding party walls on each side.

It may be taken as a canon of architecture that buildings must not only be of a construc-



FLATS IN PADDINGTON STREET, LONDON, W.
PROFESSOR BERESFORD PITE, ARCHITECT.

tion that is secure in itself, but must be obviously so; and that a building, however scientifically safe, will not be architecturally satisfactory to the eye and mind unless it also appears to be safe. Doubtless time is a great convincer in matters of artistic criticism, and if a sufficient number of examples of a novel method of construction were put before the world to manifest to it that what is apparently unsafe, perhaps hung upon nothing, is after all perfectly secure and scientific as well, after a time this canon of architectural criticism would be satisfied in spite of itself by the relation of experience to judgment and the disappearance of that distrust of novelty which is a gift of Providence to save men from calamitous experiment.

The Shop Windows.

We should have become accustomed, perhaps, by this time to seeing great and massive erections of weighty stone and brickwork poised upon the slender brass pillarettes, lace-like arches, plate-glass fittings and mahogany fascias of shop fronts; but we are, I am sure, suffering artistic discomfort and deriving no pleasure from their carved and ornamental blandishment owing to the initial hiatus that the system of architectural design employed demands a basement and obvious foundation, and has none. With this difficulty the modern architect wrestles ineffectually; the implements

of his trade were all made for buildings with bases, and he knows not how with them to fashion a modern design without obvious support. The difficulty is everywhere self-confessed, and causes an infinity of interesting and sometimes amusing expedients. The projection of the shop front beyond the general face of the upper storeys of the front, thrown out so to speak as a screen beyond it, is a device only very partially successful; it has a certain sufficiency when the shutters are down, but modern progress is depriving the shop architect of this scrappy resource for architectural effect at close times and on Bank- and half-holidays. The void is there, gaping all the week, with perhaps the flimsiest draperies depending from the ceiling within it, dispelling all illusion as to supporting a very mine of weight overhead. The emphasising of the end piers which mask the party-wall ends, and the development of a cornice with the shop fascia to connect them and form a horizontal bridge, on which the upper part is carried, is frequent. This should be a more satisfactory method, as it would disregard the shop front and its contents, and dissociate the composition of the upper storeys from the lower ones. The failure, however, occurs in that the establishment by this treatment of a factor of architectural proportion integral to the whole front has as yet failed to obtain recognition. The architect supposes that the business has been completed, and proceeds in designing the floors immediately over to dispose his proportions in the traditional way, employing lintels and openings of ordinary narrowness, each of which is unconsciously engaged in defying the exaggerated yawn of the cavern below spanned by a member of their own architectural family under abnormal conditions. It may be more easy to point out than to demonstrate that the system of proportion compelled by the ground storey should be recognised in the design of the upper ones; and though openings above are not required of the extent of that below, there is a logical symmetry of spacing which would take the first factor, and by progressive reduction of systematic sub-



SCULPTURED FIGURES TO DOORWAY, PRINCES STREET, CAVENDISH SQUARE, LONDON, W.

division apply the scale and diminish the proportions harmoniously, with satisfactory results.

The Mezzanine.

We have referred to the usual treatment of the shop or ground-floor storey by supporting pilasters and a carrying cornice with a reversion to ordinary proportions in the upper part, but the treatment of the storey over the shop front as a mezzanine or *entresol*, and as part of the shop front, must not be omitted. A few years ago it was more commonly used as an architectural device for getting over the difficulty of affording apparent support to the upper part than it has been of late years—the later developments of shop design having a tendency to make two storeys of shop fronts extending over an area of plate-glass unbroken by constructive lines, over nearly half the elevation of the build-

ing. The mezzanine proper was enclosed by an arch springing from the side pilasters at the level of the head of the shop front, and spanning the whole frontage, if one of ordinary narrowness, rising to the underside of the floor over the mezzanine; thus an arch is gained of considerable size, and at first sight of some capacity, not only for carrying the upper storeys but of blending the smaller scale of that part gradually and harmoniously with the ground floor.

For single house and shop fronts this method has not proved very successful. It can be easily imagined, and indeed seen in many examples readily called to mind, that a large arch springing from narrow pilasters on the extreme limits of a frontage gives the impression that its thrust must be acting upon the neighbouring buildings—in the most likely cases also shops—and appearing to crush them. The initiated will, of course, understand that this will not actually happen, as the arch is more apparent than real, the weight of the upper building upon it being probably carried on a concealed horizontal girder behind the crown of the arch. The success of the arched mezzanine treatment therefore depends largely upon its neighbouring abutments, and unless these are controlled by the same designer, or pre-exist in a satisfactory way, the experiment is very risky. Instances can be cited in very modern London of lofty and powerfully-drawn arches of brick and stonework carrying with apparent scientific and architectural balance a series of upper storeys, but conveying their weight by every optical demonstration of mechanical law against the plate-glass expansion of a neighbouring elevation of the picture-frame order.

The *entresol* arch is also dependent for complete effect upon a sufficient reveal or exposed thickness on its under-sides to convey the impression of the substance and strength requisite to ordinary walling materials. This becomes difficult, if not impossible, where the shop front is continued upwards into the mezzanine, but can be obtained by recessing the window of the mezzanine upon the shop fascia.

The arched mezzanine treatment is most satisfactory, if not only so with any certainty, when several fronts can be treated alike and a continuous effect, as of an arcade, obtained, the arches over each shop corresponding and providing the effect of mutual resistance to thrust which is required. In such cases there is no reason why the arched construction should not suffice for carrying the wall above, provided that the easement of support required from the neighbouring houses is secured by the mutual covenants which originate in a joint ownership of such rights. The north side of New Oxford Street, towards its western end, affords a successful and satisfactory example of this treatment, the general proportions of the whole block and the reduced window requirements of the upper storeys being harmonised with large openings of the ground and mezzanine storeys by the architectural treatment of the arcade. Though this example may be open to other criticisms as to internal arrangement, it presents a standard to which, unfortunately, there has been no approach in any more recent example of an extended façade of shop fronts. The architect should be urged to continue to make use of the storey over the ground floor as a mezzanine on account of its value in extending the carrying proportions of the shop front, and of combining them with the complementary storeys of the building into a homogeneous and expressive design.

In general, architectural proportion is so much a matter of the relation of the solids to voids, that the designer of a shop-fronted house, limited as he is by earlier considerations, has very few principles left to guide him. The relationship of voids to solids cannot apply to this class of design, because the solids have to be eliminated as a condition precedent to suitability for shop display. The architecture becomes a collocation of window-frames, and the solids of which these frames are apparently constructed are unreal, concessions to architectural fancy, as in most cases the stone piers and window heads are but casings to metal girders and stanchions, large and small alike. Deprived of grouping, confined in perspective, tied to a topsy-turvydom of design, the architect of a shop front has difficulties to contend with which one devoutly hopes that he is alive to.



FRIEZE, NOVELLO AND CO.'S PREMISES,

But it is to be feared that the instructions of his commercial employer that his new front must be exactly like a superior rival's, or must be like the Louvre in Paris or like a Scotch castle, have steeled his artistic soul, and he reflects that it is hopeless and profitless to struggle with a client who has no taste, and that after all he is not paid by him for any other purpose than to provide him with just what he knows he wants.

Names and Signs.

We have not mentioned other artistic terrors, as figure or name tablets, signs and electric starters, in many cases necessary to commercial existence, though rendered so only by the force of a bad habit which could be readily and painlessly cured by statutory enactment. It may be suggested to the commercial world that the "best" shops and streets of shops in London are those where this obnoxious habit of self-assertive emptiness is less apparent than elsewhere, and that reputation and success are assumed by the public to belong to that house of business that dispenses with—to put it mildly—inartistic advertisement. However, as part of that frank modernism which we have predicated for the commercial architect, the provision of significant spaces for inscriptions and of such signs as architecture can, by deliberate forethought and pre-arrangement, make properly conspicuous and artistic at once is a certain part of his problem, and a by no means unpleasant one. Inscriptions and signs add a literary value to buildings which grows in value with every year of their history, and we could foresee a pleasant development of particular symbols and types in commercial architecture expressive of and akin to purpose in the building, of use alike to the tradesman and of interest to the public and artist.

Horizontal and Vertical Principles of Design.

The architectural qualities which can be exhibited in street architecture are thus comparatively limited. In the greater number of cases the front or façade only can be seen and is capable of considered design, though in corner buildings there is a return frontage available which admits of some grouping. The fronts of the many buildings forming a street are each comparatively narrow and lofty, and unless the street is a wide one the general effect of the design can only be appreciated from the limited standpoint of the pavement, either in sharp approaching perspective or in a directly opposite view from a point near to and under the building. These limitations very seriously affect the possibilities of successful results, it being borne in mind that the success of the architecture is that of the executed building *in situ* and not of the harmony of the proportions in true elevation or upon its picturesqueness in an ideal perspective view. The test of satisfactory result rather than of pleasing elevation must be applied rigorously to his work by the architect. This is not an easy thing to do, as each projection and horizontal effect is accentuated, while vertical lines and proportions are all foreshortened from either of the possible perspectives of an ordinary street. London architecture has but few examples of suitable methods of dealing with this difficulty. The horizontal cornice upon the skyline and similar lines subdividing the front above and below each storey of windows are the more usual methods. These have become simple to the designer solely from custom and from the facility with which they are drawn with a T-square, but a free consideration of the problem of designing narrow frontages to lofty buildings in a narrow street would certainly suggest that horizontal lines, with no continuity beyond the limits of a small site, are possibly not the only means with which to attempt suitable design. The varying contours of streets, sometimes broken, curved and crooked, sometimes in long straight lines, would direct some treatment which would not necessarily—as continuous horizontal lines must—throw each separate frontage into violent contact with the proportions of its neighbour.

There grew up in Gothic times in the narrow devious lanes of busy mediæval towns a method quite as universal as the use of horizontal cornices and lines, in the use of vertical ones, the grouping and arrangement being upwards, each window in a storey being grouped over the one below it, the margin lines being made

continuous and carried up into a gable in which the centre one often reached to the top, creating storeys in the roof as it went up. The principle seems more natural and proper, and one can easily imagine its growth among the craftsmen as a necessary tradition of street building, and vindicating itself by its suitability and truth of expression to their artistic instinct. It may be remarked that in other branches of building, all of the same period, such as in the external design of churches, detached houses and castles, there is no such universal tendency of vertical expression in the Middle Ages, the use of ornamental and corbelled parapets tending to complete many aspects of these buildings horizontally. But in street architecture the vertical grouping is very general, and instances of any other principle would be difficult to find and group until the dawn of the Renaissance, which brought with it the cult of the enormous horizontal crown or cornice.

Many examples remain in the Low Countries and in North and Western Germany—as at Lübeck, Münster in Westphalia, and Nuremberg—of the assiduous application of the vertical principle to narrow street fronts, executed in brick and stone, and collectively a more instructive exhibition of the innumerable possible combinations of simple forms upon one method is obtained. Of similar wooden architecture, where the horizontal principle of beam or lintel construction necessarily enters all the construction and design, England furnishes examples in cities such as Chester, Shrewsbury and Tewkesbury, while in Normandy there are many refined examples of beautiful half-timber fronts. The application of a delicate artistic originality emphasizing and giving value to vertical expression can be observed in mediæval examples, and the employment of horizontal steps in the brickwork gables, so characteristic to us of Bruges, is echoed in stonework examples in Westphalia, while the Scotch corbie-stanes, or crow's feet, all subserve the same vertical principle of design. The advent of the Renaissance in Northern Europe did not, as in the South, bring the pedantic use of huge shadow-casting cornices into its less sunny clime—that was left for the pseudo-Italian palaces which made the modern London of fifty years ago so gloomy—but allowed a great freedom of treatment in line and ornament, gradually casting loose from the craftsmen's methods of development from purpose, fitting and subduing all to preconceived notions of architectural effect. Swirling curves and disjointed architectural fixtures soon began to exercise themselves upon the polygon of wall surface provided by the front with its gable, and it was not until the need of a new restraint began to make itself felt that the freedom of rococo treatment was reduced by a steady application of horizontal cornice lines over and under each storey of the façade.

Picturesque Streets.

The happy independence which was obtained by each front, when the vertical method of design was practically universal, procured in the aggregate of a street view a charming grouping and freedom which has a fascinating effect, and always proves attractive to the artist-follower of Prout and Roberts on his sketching tours. The more or less flexible curves of the lines of road and gutters in a winding narrow street combine and yet contrast with the closely-grouped vertical sub-divisions of the house fronts, often broken by occasional projecting oriels or corbelled turrets, or in half-timber work by joist ends and brackets, and with the gable peaks in varying proportions, heights and skyline pictures naturally form themselves without effort of fancy or composition. The charm of a mediæval town has certainly within it a basis of reasonable beauty instructive to us as modern street builders which will bear stripping of its antiquity and associations—that is, of the quality with which we cannot endue our designs—and compare instructively with the artistic effect of more modern thoroughfares, whether purposely architectural as in the chill sobriety of Moorgate or King William Streets, or accidentally arranged on modern lines as in Queen Victoria Street or Shaftesbury Avenue.

We do wish to assure an universal artistic principle of street-building design, for to do so would be to limit the illimitable possibilities of

artistic combination and effect, but from the impressions of result we may derive safely enough the conclusion that in narrow frontages the design should be self-contained, its lines terminating satisfactorily within their own field, and the direction which is to the eye unbounded—namely, the vertical one—being that in which the artistic sense of appropriateness can be best brought to play; while totally the effect of a street or city built of independent but self-contained designs is pleasing, the separate fronts adding together picturesquely in the necessarily horizontal perspective of the streets.

Uniformity and Symmetry: Regent Street.

There are, however, many principles of design and ideas of symmetrical or picturesque arrangement beside those into the discussion of which we have gone at some length.

The principal consideration, in contrast to what we will call the mediæval independence of each frontage, is that of a uniformity compulsorily applied either by that relic of mediævalism most necessary and useful to architectural effect, the lord of the manor, or by special legislation. The underlying idea in such cases is the assumption, almost an unproved one, certainly uncertain, that uniformity of effect in street architecture is necessary and desirable in the interests of dignity and art. This whole doctrine of architectural symmetry has been courageously assailed by Gothic revival enthusiasts, its value denied, and its effects of repetition and graduation scouted, as formal weaknesses alien to the picturesque and truly artistic. The present generation stands in many respects at the parting of the ways. The heat of Gothic vigour has evaporated, and we are prepared to consider its artistic assertions at least as coolly as we have regarded the orders and proprieties of the preceding school which produced Regent Street and park.

Within the last half-century public taste, national genius, or what you will to call that will-o'-the-wisp, has romanticised into mediævalism with its guilds and crafts, ideally uniting work with art in life, and not in vain; also not in vain has it discovered the charms of the Bloomsbury and Soho view of art life, with its sober respectability of external appearance and delicious completeness within, reticent to plainness about the house and home, and serenely Athenian in monumental churches and porticoed institutions. While this sprite of fashion is at present dissipating her enthusiasms in a somewhat libertine interlude, we can do no harm by putting in a plea for the organised hypocrisy of Regent Street, with its many and various dispositions and sub-divisions successfully masked in stately groups and blocks culminating in the magnificent quadrant, new-made annually with fresh paint which renews every architectural feature with whiteness of surface—and is not architecture but mainly surface matter, after all! The sense of scale, of grouping, of harmony and of successful regulation still survive in Regent Street, though well-nigh three-quarters of a century have elapsed since it was designed, and of all London streets it is yet the only one of which, as street architecture in total, we can in any way be proud. We must not fail, though, to qualify our self-congratulation by the objections which lie below the surface, for they will practically prevent an entire repetition of the experiment. The stately grouping of varying blocks has been achieved mainly by the sacrifice of what to-day would be altogether too valuable comfort in arrangement and of market rental value in the "upper parts." There is a manifest wrestling between internal facts and external appearances, which struggles with windows, parapets and roof lines. The pleasant proportion of width of street to height of building will be rarely attained now in any great city, and the charm of curved line on which the whole street scheme is planned from St. James Park to Langham Place is uniquely happy in its architectural effect. The effort was a great one; the genius of Nash one for the occasion; and the result characteristic of the age that produced it, and serviceable and delightful to that which has followed. London would frankly approve of a repetition of the occasion, effort and genius, and of a result as expressive of our generation as of that of the First Gentleman of Europe.

Speculative Building in Important Streets.

A practical aspect of our subject sorely presses us to-day in London, and to some extent in all our larger cities. We have been considering the improvement of our street architecture upon definitions of the requirements of commercial buildings, and the way in which the architect seriously devoted to the advancement of his art can meet and give them artistic expression. These requirements postulate as a requirer an intelligent progressive man of business, as also a sympathetic and trained architectural mind to consider them. But practically neither the business man nor the architect have anything to say upon the matter in a way which can affect street architecture, for their buildings are ready made for them. They are the production—and as such also express the characteristics and ideals of their producers—of building investors who, buying or securing the most prominent and serviceable sites, have erected speculative shops and warehouses upon them as ready-made goods for the purchaser. I do not propose to take any exception here to the speculative purchase of land likely to become valuable, or to its being offered at the highest obtainable figure; and though it is gravely open to doubt whether the policy of providing ready-made buildings is the best and most profitable either for the promoter or purchaser, or for both, I conceive it well to be within the proper limits of our subject to protest in the name of our commercial men, in the name of architects and of all passers-by who have regard for the pleasant, decent and beautiful character of the cities of our land, against the outrageous garity of design, ignorance or defiance of elementary considerations of appropriateness, of proportion and of architectural suitability in expression, and against the abominably bad ornamentation that characterise the great speculative building blocks recently erected and now being carried out upon many of the most important sites in the metropolis. There seems to be no protection for the public, refined or refined, against the insults to taste and national self-respect by which the sordid incapacity of grossly ignorant men defaces our finest and most important thoroughfares. The architecture of the whole class of speculative building is normally of a low class, but since this element has invaded the more expensive sites and proceeded to erect buildings demanding the highest rents the depths of the degradation of speculative building art have received a new exploration and exposure that is appalling. Kind nature makes us slowly oblivious to constant or recurrent physical pain, but, speaking from painful experience, I cannot discover any such alleviation in the doom of having to come into daily contact with buildings in high places exhibiting the worst effects of architectural degradation. Indeed, a settled despair of London, in spite of much in many directions to give bright hopes of oases of cheer in the desert, drops with chilling and deadly effect upon that zeal without which an architect is fairly useless to his fellows and his art. A really bad building is a upas tree, to be destroyed, as rapidly as possible, and of the real badness of this branch of modern street architecture no one has any doubt. It is not even to be expected that the promoter or even his architect (so-called) possibly knows or cares

that it is bad or good; their interests are otherwise entirely wrapt up in present profits, and these are compelled by the occupation by their buildings of certain positions, and ensured at no more or less, whether the architecture is a source of pleasure or pain to the citizens upon whom it is forced. We protest; if we can do nothing else we will make this beginning by crying revolt against a shameless bad architecture, continued disgrace to our building art, commercial intelligence, national self-respect and civilisation. There are no good points, not even of arrangement and suitability or improvement, in the design of these blocks, and their construction sails as near inefficiency as the administration of a difficult statute by hard-worked and heavily-handicapped district surveyors can allow.

Regulation of Designs.

In conclusion, it is not, perhaps, much good railing at a blot, however iniquitous, upon the surface of a city; but as the mischief is spreading rapidly, we would point out again that, while not limiting buying or selling, free trade if you will, in land of public or private importance, there is a definite call for such a censorship, as liberal as you like but cultured and wide, that will prevent the intrusion of ready-made or purposeless buildings of hideous and incompetent architecture upon our public streets. With good will some reference to authority of designs in important streets of distinctive character should be readily obtained, not only as at present exists by statute upon construction, height, purpose and accommodation, but upon the more widely-dispersed, though less concentrated evil, of bad design. There is as yet no sufficient standard of public taste to enable us to trust such censorship without fear of controversy in the hands of any mere officials, but with the organised societies for the promotion of the fine arts and architecture and for the improvement of our cities there should be no difficulty in obtaining sufficiently large committees of taste willing to proffer advice and criticism and exercise veto without illiberality or narrowness. There may be danger in this suggestion, the censorship may prove either a stork or a log to the frogs, but there are greater dangers in the continuance of the existing state of things, for some of the best streets of London are already marred and appear to exhibit a gross decadence of public taste, which is really as untrue as any other artistic characteristic of such buildings.

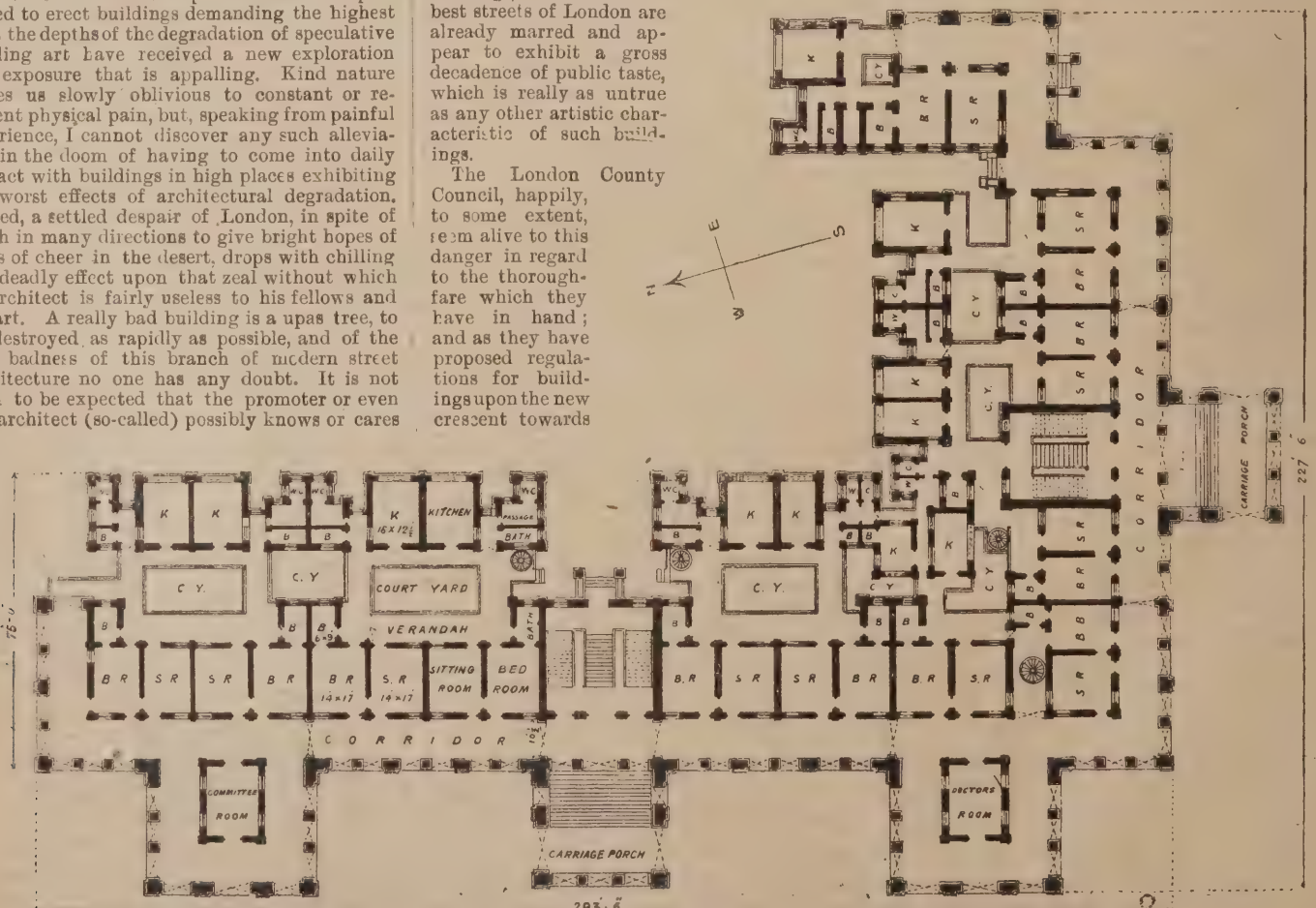
The London County Council, happily, to some extent, seem alive to this danger in regard to the thoroughfare which they have in hand; and as they have proposed regulations for buildings upon the new crescent towards

the Strand, and have held a tentative competition for uniform designs, that certainly mark a progression of ideas in the direction of proper control. But the subject is one of great difficulty and complexity; and unless the control is in the first place wisely directed in the true interests of successful architecture by highly competent hands, and in the second is so entirely firm by enactment and covenant that it cannot be broken away from, the experiment will not be successful. These two conditions are not unattainable, and Londoners hope for much, as as they always do, in spite of much disappointment. Into the discussion of the great new street from Holborn to the Strand, so full of detail and interest, we cannot now enter if we would. The preliminary work is too far advanced for suggestions to be of much value to the authorities, but we can and do appeal to all who build in our streets, whether promoters, owners, men of commerce, of speculation or of public purpose, to employers, builders and architects alike, to consider how deeply important is the right use of every opportunity of permanent building to the whole city; and if character is written in stone, wood or iron, that character should reveal devotion to the highest ideals.

Masters and Men.

The Operative Painters at Horwich are on strike for an increase of wages from 8d. to 8½d. per hour so as to bring them up to the same rate as Bolton. The masters refuse to give the advance to all the men, but special hands are now engaged over the sum asked for. One firm has granted the advance.

Coventry Building Dispute.—The Coventry building dispute is settled as far as the bricklayers, labourers, masons and painters are concerned. An alteration of working hours in the winter months has been agreed upon. The carpenters and joiners are asking for an advance of a farthing per hour. If they decide to insist upon their demands, then the question will have to be submitted to arbitration as the rules provide.



THE FRAMJEE DINSHAW PETIT PARSEE SANATORIUM, CUMBALLA HILL, BOMBAY: GROUND PLAN.

ARCHITECTURAL ASSOCIATION.

Mr. CARÔE ON THE PRESERVATION OF ANCIENT BUILDINGS.

A SPECIAL general meeting of the Architectural Association was held at 9, Conduit Street, W., on Friday evening last. Mr. E. Guy Dawber, vice-president, who occupied the chair, proposed that the following alterations and additions be made to the by-laws:—

By-law 26: Substitute the words "first ordinary general meeting" in place of annual general meeting.

By-law 30: Omit the words "hon. auditors."

Omit by-law 36.

By-law 42 to read: "42. The first general meeting during each session shall be the annual general meeting for that session, and at such meeting the prizes shall be distributed, the president shall deliver an address, and short addresses shall be invited from senior members of the profession. At the first ordinary general meeting each session a statement of the accounts of the Association, duly audited by a professional accountant, shall be laid before the members."

These alterations and additions were agreed to. The ordinary general meeting of the Association was then held. After the minutes had been read and confirmed, Messrs. H. C. W. Dod (London, N.) and J. A. Maxwell-Stirling (Madras) were elected members of the Association. The chairman then announced the following additional donations to the New Premises Fund:—

	£	s.	d.
Worshipful Company of Clothworkers	50	0	0
J. T. Christopher	10	10	0
C. Harrison Townsend	10	10	0
Louis Ambler	5	5	0
A. M. Torrance	5	5	0
O. F. Longden	5	0	0
H. Longden	5	0	0
F. Lishman	3	0	0
R. W. Collier	2	2	0
C. Dunch	2	2	0
E. W. Lees	2	2	0
W. J. Norbillard	2	2	0
A. W. Papworth	2	2	0
J. D. Slater	1	1	0

Donations previously announced 106 1 0
3,957 7 6

Total £4,063 8 6

Mr. R. S. Balfour announced some additions to the library, and the chairman then read the House List for the next session, which included Mr. Henry T. Hare as president, and Messrs. W. A. Pite and Louis Ambler as vice-presidents.

Mr. W. D. Carôe then read his paper on "The Preservation of Ancient Buildings." After referring to the Cambridge Camden Society the lecturer spoke of Sir Gilbert Scott, with whom the attempt to reconstruct the past rather than to preserve it grew like a fungus, plunging a great and deserved reputation into the dust. Reference was next made to restoration in France, Germany and Italy, where a large number of ancient buildings had been changed into cast-iron echoes of themselves. Viollet-le-Duc deliberately set before himself the goal of recovering the supposed form of a building at that precise period of its existence which he pedantically elected to be the most beautiful, or most interesting, or both. Leon Cathedral in Spain was an example of this method. The façades, the guide-book tells us with satisfaction, "have been purged of their Renaissance disfigurements," yet observe the inanity of the "Gothic" which has taken their place.

Mr. Carôe continued:—The restoration of the walls of Carcassonne, upon which, under Le-Duc, the French Government has wasted untold thousands, and aided by which Le-Duc was able to lay before us with a scholarly intuition and definiteness worthy of all praise the history and science of Romanesque and Mediaeval fortification, forms a striking, not to say ludicrous, example of the failure of the method, even in erudite hands. The further works now in progress in which Le-Duc's methods are being carried forward are really more comical than words can express. One is indeed tempted to ask if these men are quite sane. All over Europe works of a similar kind have been during the last thirty years, and still are, in active progress, and yet the modern spirit of a newly-emancipated continent is such that these gross misprisions of antiquity are warmly approved, and mediæval travestie

are too often regarded as glorious national monuments.

If I am asked for examples, they occur in every town, almost in every village: Angoulême with hardly an ancient stone left undisturbed; Leon largely rebuilt; Upsala a modern building; St. Mark's, Venice, externally an engineer's construction; St. Front, Perigueux, with the bottom knocked out of its remarkable history; Albi restored, and now being re-restored apparently for the sole cause that the French Government does not know what to do with its wealth; that marvellous courtyard of St. Gregorio, at Valladolid, wrecked and rebuilt, and all its wondrous carvings scraped up into soapy whiteness; the delightful sculpture of Wisoy being recarved because the architect (he told me so himself) thinks they are archaic and the heads too big for the bodies, and that he can draw them better, brilliant draughtsman as he undoubtedly is; Trondhjem and Stavanger new cut; Frederiksborgslot restored by a brewer like unto a public bar. And in Germany! The restorations made in Germany are more appalling than words can tell. I know not where to begin nor where to stop in referring to them.

I am not exempting our own country. We have suffered grievously—irrevocably—and not the least from the curious revivalist heresy that the art of architecture stopped short in the year of grace 1534. We are still suffering, but fortunately a sounder sense of proportion, which I am here to advocate to-night—the sense of preservation—is gradually making headway among us.

In passing, I refer to one other "grim" one-man school of destructive restoration, which is fortunately individual and unique—the brutal, ignorant, conceited, self-opinionated "school" of Lord Grimthorpe. It has been as much a disgrace to the century and the Church which permitted it as to the man who has had the effrontery to direct and to pay for it. Silence is perhaps most meet where memory is pain.

Parallel with this, but unfortunately on a wider plane, is the rapid destruction of ancient monuments to make way for so-called modern improvements. We witnessed lately how our County Council destroyed Tudor House to make way for an extra bit of asphalt.

But preservation, too, has its extreme forms which, like all extremes, carry their dangers to a good cause. I am most fully in sympathy with the primary tenets of the Society for the Protection of Ancient Buildings, but I must not be held to endorse all its methods.

I commend the various advisory leaflets issued by the Society, with special mention of Professor Church's recent admirable excursus upon wall paintings. They are generally sound and practical and instructive. But there will not be found very succinctly laid down the following somewhat inchoate and elusive principles which I have endeavoured to cull briefly from some examples executed and statements made by members of the Society:—

1. As a general axiom, a building is to be considered as a gem in a glass case. To touch or disturb it in any manner whatever is an act of sacrilege (a sentiment with which I, for one, heartily concur).

2. Nevertheless, you may whitewash it to any extent. You may rake out the inside of the walls, and substitute blue brick for old core without stint. You may rebuild or finish an interior with blue bricks, or you may patch up cracks externally with blue bricks.

3. But you may not patch them up with the original material of which the wall is built. That is counterfeit.

4. When you come to tracery, however, you may repair that in stone, and make such a copy of the old as you may be capable of. That, somehow, is not counterfeit.

5. You must underpin on all possible occasions.

6. And just as you may use whitewash, you may also use plaster. You may, indeed, "restore" ancient plaster in the fullest sense of the obnoxious word. In the eyes of the Society there is some special virtue in plaster as a mediæval building material which claims for it a treatment more exacting than you might accord to highly-wrought stone or timber, let us say.

7. Finally, the Society for the Protection of Ancient Buildings may advertise you and itself,

or you may advertise the Society for the Protection of Ancient Buildings and yourself, in the Press, or on quaintly-lettered tablets—if, that is, you are acting under its agis.

8. But woe betide you if you attempt anything whatever in any direction in connection with an old building without such imprimatur.

Here, then, I have briefly referred to the methods of the extreme schools on either side. The first is purely destructive, and the second creates in place a reactive method, apt to impress itself in illogical fads, as for instance when it whitewashes Exeter Guildhall, and is quite ready, we have been informed, to whitewash Westminster Abbey.

Now, I believe that wisdom lies once more in the *Via Media*.

If the tower and spire of Salisbury Cathedral were to fall to-morrow (from which catastrophe we have lately been saved by a restoration in defiance of every precept of the S.P.A.B., but against which no word of criticism was breathed), will any one say that we should do wrong in rebuilding it on the old model, and all that it destroyed in its collapse? I certainly should recognise such a reconstruction as a legitimate "counterfeit." Too many windy words have been wasted over so-called "counterfeits." Do we blame the Perpendicular builders of Westminster Abbey and accuse them of counterfeit because they imitated the Early Decorated style, and in some places very cleverly? Or do we call in question Mr. Micklethwaite's work, daily growing at the west end? It is, as I understand, a necessitous reproduction of ancient forms.

There are two primary principles which govern all cases:—1. In an ancient building not a stick nor a stone shall be moved if a sufficient reason is forthcoming to keep it where and how we find it. 2. When the work is done, no modern workman's mark shall be seen wherever such can be avoided.

The question arises: "How far is the ancient to give way to modern requirements?" Primarily the answer is, and this must be our third principle, "It is not to give way." Nevertheless, common-sense says that a building whose life, so to speak, is active must be suited to the needs of the day, within reasonable bounds. But I would ask you to bear in mind steadfastly that the tendency of to-day is to do too much, and you will never err on the wrong side if in the matter of adaptation (I am not now speaking of stability) you do too little. You cannot preserve too much.

It may be convenient at this stage, after the mention of these three guiding principles, to subdivide the buildings with which we are called upon to deal into three classes:—

(1) Ancient buildings which have continued in the use for which they were erected up to the present, and which it is desired to preserve for the same use—cathedrals and churches chiefly, detached monuments, some mansions and schools.

(2) Ancient buildings which have gone out of use, but which it is desired to recover to their old use or adapt to a new one, or incorporate into the midst of new buildings—old manor houses become farms, or farms become cottages, or ancient school buildings incorporated into a modern growth.

(3) Ruins of ancient buildings which it is desired to preserve as ruins and to prevent from further decay.

Now, while the same principles will govern in all divisions, the practice in each will vary somewhat. In applying them, let me recapitulate succinctly the three principles already enunciated:—

(1) Nothing shall be touched which can be left alone.

(2) We must efface our own work.

(3) Ancient work shall not give way to modern needs.

These are primary precepts. Hardly in any case will it be possible, unfortunately, to fulfil them; but according to the measure of our success in doing so in our work will that work be itself successful.

A fourth general principle applicable to all cases has to be stated, although it goes as a matter of course.

(4) Our first efforts will be directed to the stability of the building.

A fifth will, perhaps, not be so generally accepted in regard to all three divisions; it is

(5) The beauty of an ancient building is not to be marred by inharmonious accessories for any purpose whatever. The proposal, for instance, once made to build great brick buttresses to prop up the west front of Peterborough Cathedral I regard as simply brutal and an insult to the designers of that remarkable work. I cannot subscribe to Ruskin's precept, "Do not care about the unsightliness of the aid," although I admit its argumentative effectiveness.

The sixth and last general principle will be :

(6) In all cases ivy must be removed and destroyed.

Mr. Caröe then proceeded to deal with these principles in detail as concerned with the three classes of buildings under consideration, in the course of which he said :—

First see to your foundations. Remarkable although their work was above ground, the medievalists were sorry scampers in the matter of foundations, and they seemed to have exercised no forethought as to the weight they proposed to put upon them. It follows that underpinning is a frequent necessity.

Next repair the cracks and consolidate the core of the walls. I need hardly mention the utility of liquid grout in this connection, but must warn you not to use fresh cement.

Then we have often to deal with leaning walls. The idea that a wall is dangerous or necessarily going to fall because it leans is an absolute, if popular, fallacy. The mechanics of the question are simple enough. Remove all lateral pressure and the wall will not fall until the line of the centre of gravity passes outside the base. If the wall be buttressed there is a still greater angle of safety.

Let us pass to the repair of decayed stonework. The panacea for such decay, as advocated by the Protection Society, is whitewash. The panacea of the restorer is of course wholesale reconstruction. Now, a committee of chemical experts and architects has been sitting for a prolonged period in the endeavour to discover some process by which the unfortunate decay in the stonework of Westminster Abbey may be arrested. Where such decay has taken place in stones of which the chief constituent is carbonate of lime, and where the cause is the sulphurous emanations from the modern town atmosphere, which convert carbonate of lime into gypsum, a soluble substance, an arresting remedy has been found in baryta-water (hydrate of baryta). You may see the effect inside the chapter-house, which has been dealt with under Professor Church's able direction. Unfortunately in other places, where such a remedy was most needed, it proved a disappointment, and it is evident that it can be used only with the greatest circumspection. But the committee's report will be awaited with interest, especially if it determines for us the value of whitewash.

And what of the wholesale restoration? I adhere definitely to my precept No. 1. I should always myself advocate the employment of two architects in collaboration on any work of reparation, so that rashness or error or ignorance might be curbed in their effects. But in any case I should like to see constituted an authoritative committee to whom the younger man—and his senior, too, for the matter of that—might come, free of cost, for the resolution of his doubts and difficulties.

Now, the principles I have suggested for stonework apply generally to woodwork.

The beautiful roof of Gedney, Lincolnshire, was in the last stages of decay and dilapidation. The walls were pushed out and cracked in all directions. It was repaired without moving a single timber from its place. I can conceive no greater stigma attaching to an architect than that he finds it necessary to replace an old roof with a new one because the old one is seriously decayed.

In your windows recollect the vast importance of iron stanchions and saddle-bars, and on no pretext allow the ancient ones which you find to be done away with. If the iron has rusted in the stone, it should be temporarily removed, the rust filed away, and while the surface is bright it should be reset in cement. Paint it then with two good coats of red oxide before it has its two final coats of black, and it will not give trouble again. Stand out as far as you can against wire-protecting guards to stained-glass windows. I find that these make excellent

chicken runs for the parsonage garden. A word further of warning, and I have done on this head. If you find cracks in your tower, look to your bell frame.

Mr. Caröe closed the consideration of churches by briefly applying these principles to a hypothetical case in which an architect is called upon to "restore." He next dealt briefly with the second class of buildings, to which the general tenor of his preceding remarks applied, after which he spoke of the third and last class—ruins. He said :—I have reserved till now the sixth principle—the destruction of ivy. Of course I shall be told that I am advocating the destruction of the picturesque, but it is not so. Quite apart from the destructive qualities of ivy, the entire concealment of architecture by any evergreen growth is merely the rendering of it valueless. One is reminded of the seer of Brantwood's words: "The artist who looks to the stem of the ivy instead of the shaft of the pillar is carrying out in more daring freedom the debased sculptor's choice of the hair instead of the countenance."

Of course, in the early days after ivy destruction your building looks bare and unclad, but take heart and counsel. Nature has provided a most happy substitute, which is as harmless as it is beautiful. You may plant *ampelopsis viticella* to any extent, the lovely light-hearted and fickle but always tender sister of the stern and solemn ivy. After two or three years of patient tending and watching the growth of a plant which has tested and likes its situation is almost phenomenal. You have the lovely daintiness of the spring leaves, the richness of the summer green, and the glory of the autumn sunsets. And when the glory has departed, all your architecture is revealed again, with the slender tendrils only adding texture to the walls.

At the highly interesting church of Westwell, near Ashford in Kent, a church where the thirteenth-century groining is done in concrete, this lovely creeper has been permitted to grow over the window glass, which it loves to do. The glass is fortunately transparent. The effect is more beautiful than any modern glass-painter has ever conceived. I commend it to you.

To recapitulate :—First, get rid of the ivy on your ruin. The thick stems should be cut at about 3ft. distances and dressed with corrosive sublimate or any strong destructive chemical. The ivy must not be torn down from the face of the wall until it has lost its power of clinging, and should then be most carefully removed by the aid of scaffolding, and, what is still more important, the aid of tender-handed and careful workmen.

Obviously the most important duty is to protect roofless walls from the inroads of rain and frost. The method adopted at Kirkstall was to carry the irregular walls up to more or less the same level and cope with flat stones, slightly weathered. This, no doubt, is practically effectual if the coping stone is good. But the sacrifice is very great. The building loses its picturesque claim as a ruin, and becomes formal at once. I cannot see that so drastic a treatment is necessary. It is quite possible to remove the soil and vegetation from the rough wall tops, and grout them in with cement, leaving their irregular contour, and it is only necessary to provide for carrying off the rain with fairly even distribution.

We come now to the difficult point of the treatment of reconstructions of an ancient building, necessary for its proper sustenance.

Occasions arise where it is absolutely necessary to reconstruct part of an arcade, an arch, or a buttress, or perhaps a vault, or some tracery. It appears to be an accepted principle, even by our keenest historic friends, that where old stones exist and their approximate position is known, they may be put back—re-used. But the doctrine has been put forward and acted upon that although you may build part of a feature with its old stones you may not add to their number by new stones to the same section. Now, I do not hold with this system. I protest strongly against it, for I believe it to be false in logic as it is injurious in effect. If you are afraid of falsifying history, there are two courses. Either rebuild in rough-hewn masonry, which will tell its tale, or copy the old as nearly as you can, but put a mark or date on each stone if you

will leave some imperishable record of your work.

Gentlemen, the subject I have ventured to bring before you is not less difficult because barely two minds think alike upon it, and I can but hope that my views will receive their meed of criticism. But I hope, too, it will be kindly, and will give me the credit of pressing before all else upon the keen restorer the doctrine of "hands off," of recognising an actual as well as a sentimental beauty in time-worn and time-honoured antiquity, and of using my utmost endeavours to preserve what can be wiped out in an hour and, like Humpty Dumpty, never picked up again.

A discussion followed in which Mr. Aston Webb, A.R.A., Mr. Thackeray Turner, Professor Beresford Pite and the chairman took part.

Views & Reviews.

The Formal Garden.

The technical excellence of these illustrations is very great; they are of a good size and are well printed on stout paper: so that they make a very pleasant and useful album, pleasant on account of the beauty of some of the gardens shown, and useful for copying purposes for those who desire to produce miniature Hampton Courts and small models of Wilton Houses. Mr. Triggs's sketches are clear and unelaborate, their object being to set forth the plans and main details, while the beautiful collotypes present the gardens in all their charm of leaf and sunlight. The formal garden, however, can be carried too far, so that its artificiality tires and its absolute uniformity makes the observer long for a patch of grass that is not sliced up like so much brawn, or for a ragged piece of wood where the trees do not grow like pencils nor the bushes like tubs. Many of the gardens illustrated in this collection are very fine—there is a certain theatrical effect about them which pleases, and the grand scale on which they are carried out is undeniably imposing—yet the most beautiful of them all is the least formal: for the Privy Garden at Hampton Court, with its lovely trees growing in wild harmony and its peeps of lawn and path, is far more charming than all the rest: let it be compared to the very formal garden of Trentham Hall—both have a river as background—and its advantage is at once evident. Another contrast of a somewhat similar kind is offered by the Italian Garden of Wilton House, with its fine vista along the path that runs between the tall trees: here the beds are cut up unmercifully and the restlessness which they exhibit is only emphasised by the quiet expanse of lawn to the left.

Besides those already mentioned, the formal gardens of Drayton House, Hatfield House, Levens Hall (Westmorland), with its clip hornbeam walls, Balcarras (Hertfordshire), Kinross House, Drumlanrig Castle, and the beautiful terraces of Barmouth (Lanarkshire) are included in this portfolio, in addition to which some garden vases and a number of English and Scotch sundials are illustrated, and a fine view is given of the eagle-crowned entrance gates to Drayton House. To those who like formal gardens this additional collection will appeal at once.

"Formal Gardens in England and Scotland: their Planning and Arrangement, Architectural and Ornamental Features—Part II," by H. Inigo Triggs, A.R.I.B.A. London: E. T. Batsford, 94, High Holborn, price 21s. nett.

Much Art.

Sir Martin Conway, having for the past ten years occupied himself in great travels, more especially among the high mountains of the earth, people have forgotten (or never known) that for many years previously he devoted himself to the study of art. Now, however, as Slade Professor at Cambridge, in the volume under consideration he amplifies the views which he set forth when Professor of Art at Liverpool. This volume has no special literary merit, but the author, as one might expect, deals with the numerous problems in a very clear and practical manner; he acknowledges the requirements of the day, instead of ignoring them, like most writers on art; and he does not

wander into those regions of involved rhetoric or chronic moaning which are seemingly so attractive to many weary critics. Sir Martin Conway, in his first lecture, condemns the proposal to tax site values in cities, which he rightly considers would have a ruinous effect on the remaining open spaces, and he also has a strong word to say against committees of taste; but we are glad to note that "England is not a country of hopeless Philistines. Probably it does not contain a larger percentage of Philistines than Athens did in the days of Pericles. It is the structure of our society which is Philistine, not the units of which our society is composed." Sir Martin covers a lot of ground in his lectures, and he deals with so many subjects that it is impossible even to mention a tithe of them here, for they range from the art of living to photographic collections, and from "atmosphere" in a picture to the introduction of turnips from Holland. These subjects are, however, well knit together, and the teaching about them generally sensible and wholesome. The author has much to say about journalism and art, and he invokes a mead of pity for the poor critic who has one day only to rush around an Academy exhibition and is required to give his comment to the world the next morning. "Almost every artist declares that the whole mass of published art-criticism is worthless; yet probably nine artists out of ten subscribe to press-cutting agencies."—Sir Martin has indeed a sense of humour.

"The Domain of Art," by Sir W. Martin Conway. London: John Murray, price 7s. 6d. nett.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Hoods for Grates.

LIVERPOOL.—T. V. H. writes: "Kindly name a firm who make or stock metal hoods for dog-grates to brick flue."

Messrs. Young & Marten, Caledonian Works, Stratford, E.

L.G.B. Accounts.

CAMBERLEY.—W. V. M. writes: "Kindly explain how to enter up the stores account book prescribed by the L.G.B. The word 'stores' includes highway 'materials,' and if a page is to be reserved for each class of stores, one will have about fifty pages open for grass seed, dust wagons, horses, scavengers' brooms, shovels, picks, &c. Is this what is intended?"

The workings of the official mind being peculiar, if not extensive, it is impossible to say definitely what the L.G.B. require, but the querist can hardly err on the side of too much detail. But as few accounts (practically ledger accounts) as possible should be made, grouping miscellaneous matters of a kindred nature whenever practicable. Dust wagons, horses, brooms, &c., are, however, not "stores" in a legitimate sense; they should rather be classed as "plant" and excluded from the stores account book. No hard-and-fast rule could be laid down, because in a large district a multiplicity of accounts would be requisite which, in a smaller district, would be ridiculous. H. E.

The Use of Deal.

LONDON, W.—W. J. S. writes: "During some alterations to an old house in Canterbury we unearthed a small carved panel of deal wood which had scratched upon it the date '1404.' As doubts have been thrown upon the fact that the panel is really of this age, can you state whether deal was in use at that time?"

I know of no instance of the use of deal for architectural work in this country earlier than the sixteenth century. It is not at all likely the date "1404" is genuine. The earliest so-called example of the use of deal I ever saw is the old Stavekirke, originally the parish church, at Fortun in Norway, but removed bodily some

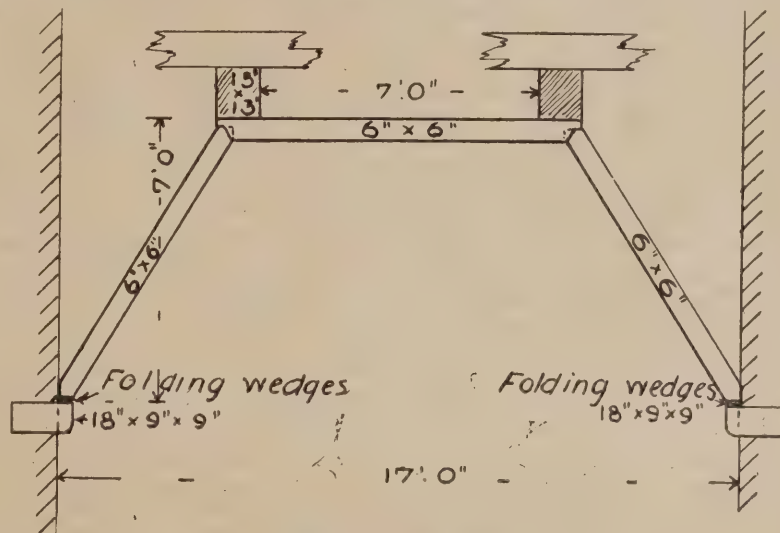
years ago to private grounds a few miles outside Bergen, in that country. It is said to date from A.D. 1150. I have had opportunities for examining it very closely, and if one excepts the two doors (both more than 3ft. wide and cut from a single plank) and some panelling, should think the greater part is not more than fifty years old, whilst the rest is even more recent. Steven's brown stain is much in evidence everywhere. Indeed, like the proverbial Irishman's coat, the fabric has been so often patched, mended and restored, that not a bit of the original structure remains.

HARRY HEMS.

Vibration of Bell Frame.

STROOD.—A. CAMPANILE writes: "The accompanying drawing (not reproduced) shows the (apparent) construction of the floor carrying a bell frame and six bells. Although very massive and clumsy it is unsatisfactory, and the rubble walls are much cracked. How could the vibration caused by the ringing be better absorbed? Would it be better to remove the bolts by which the carriage is fixed to the floor, or fix it more securely? Would it be better (and worth the expense) to remove the stonework from around the ends of the beams and leave them as shown?"

If the walls of tower are much cracked it is doubtful whether they are safe. Vibration from



VIBRATION OF BELL FRAME.

the movement of the bells may be reduced by increasing the weight upon the floor, which appears to have sufficient strength. This might be done by loading it with stone. The load may also be transmitted lower down and the 15in. by 13in. beams stiffened at the same time by adding a straining beam and struts through the centre, as shown in the accompanying sketch. The bolts of the bell frame should be well tightened up.

HENRY ADAMS.

Appointments in South Africa.

EDINBURGH.—A READER writes: "Can you give me any advice as to getting an appointment in South Africa?"

We advise you to wait till the war is over and things are a little more settled in South Africa. At present there is a plentiful supply of labour, but there will no doubt be a boom later; even then, however, you would need to have sufficient money to keep you for six months, if necessary, while searching for a situation, or possess sufficient to enable you to start in practice there as a builder and architect combined. If you have not sufficient money for either or all contingencies you would be foolish to go out without a definite appointment, which might perhaps be obtained by advertising in Cape Town or Pietermaritzburg newspapers.

Forming Mill-Pond Wall.

GALASHIELS.—A. H. writes: "A mill-pond is formed by the natural slope of the ground on three sides, the fourth being an embankment about 75yds. long and 6ft. high. The latter is

never watertight in consequence of rat-holes through it. It is suggested to have a wall of cement-concrete, say, 6in. thick in the centre of the embankment and going, say, 12in. deep below the bottom of the pond, or alternatively a similar wall on the inner face next the pond. Would a wall, say, 9in. thick at the top and 15in. at the bottom be sufficient? Please also say whether a better or less expensive plan could be adopted and prove efficient."

We advise you to build a concrete wall 6in. thick in front of the embankment next the pond and fill in behind it with finely-broken glass to prevent the rats burrowing through. If, however, you decide to build an embankment wall without a clay embankment behind, it should be 2ft. thick at the top, tapering to 4ft. 6in. at the base, but even then if the rats cannot find another outlet they will come through unless you use broken glass in it.

Assistant Surveyor, War Office.

WORKINGTON.—H. H. writes: "To whom should I apply for particulars of the War Office Assistant Surveyorships?"

Chief Surveyor, Royal Engineer, Horse Guards, S.W.

S.K. Building Construction Examination Syllabus.

WEDNESBURY.—H. M. writes: "Which issue

of THE BUILDERS' JOURNAL contained the syllabus of the South Kensington examination in building construction?"

The issue for September 18th, 1901.

Drainage of Burial Ground.

DURHAM.—CASTLE KEEP writes: "Is it necessary in laying-out a new churchyard which will be used for burial purposes to drain the subsoil of it?"

See a reply to an enquiry on the drainage of burial grounds on p. 70 of our issue for March 19th last.

Constant for Steel.

NEWARK.—M. writes: "What is the value of constant c for distributed breaking load in the formula $w = \frac{cad}{l}$ when the joist is steel? I have several books on this subject, but they only give the constant for wrought-iron."

For steel joists and girders increase the value for wrought-iron by one-half.

Planning of Restaurants.

EXON writes: "Kindly recommend a book dealing with the planning of restaurants, arrangements of fittings, &c."

We know of no book on the subject.

Particulars of our Insurance Schemes will be sent on application to the Manager, BUILDERS' JOURNAL, Effingham House, Arundel Street, Strand, W.C.

Bricks and Mortar.

APHORISM FOR THE WEEK.

When one views from without these Gothic cathedrals, these immense structures, that are built so airily, so delicately, so daintily, as transparent as if carved, like Brabant laces made of marble, then only does one realise the might of that art which could achieve a mastery over stone, so that even this stubborn substance should appear spectrally etherealised, and be an exponent of Christian spiritualism. — HEINRICH HEINE ("The Romantic School").

Our Plates.

THE FRAMJEE DINSHAW PETIT PARSEE SANATORIUM, recently erected on Cumballa Hill, Bombay, is a building of exceptional interest as a successful attempt to adapt European ideas of sanitary isolation and proper supervision to the climatic conditions of India and the requirements of native life. Reference to the plan, which is practically the same upon all floors, will show that a large amount of space is devoted to a communication corridor or balcony from which the various rooms open and are lit, a committee-room and doctor's-room being placed on the ground floor only, in commanding positions and entirely isolated. The patients, instead of being located in wards as would probably be the case in Europe, are accommodated by families in small residences, each consisting of sitting-room, bedroom, kitchen, two bathrooms and a properly disconnected w.c., the kitchens being detached from the dwelling-rooms and placed on the far side of verandah-surrounded courtyards, meals being generally partaken of under the shade of the verandah. The dwelling-rooms all have doors and windows both into the front corridor and the back verandah, thus providing a through current of air and ample light free from the glaring sunshine. Externally the treatment would have been more interesting, to an Englishman at any rate, if it had been more oriental in character, the style chosen, that of the German Renaissance work of about fifty years ago, being hardly suitable to Indian surroundings; though in even a large German city it would be considered a satisfactory and even an imposing structure. The architect is Mr. Shapoorjee N. Chandabhoj, of Bombay. The building cost 500,000 rupees, and was opened by his Excellency the Governor of Bombay (Lord Northcote) on January 24th last.—The little chapel of Roslin, bristling with pinnacles, stands on a height beyond Roslin Castle. It was built by Sir William St. Clair, third Earl and Prince of Orkney, as the choir of a larger building designed for the Collegiate Church of St. Matthew. The Earl lavished both wealth and thought on this chapel for the last thirty years of his life, and it is said acted as his own architect. The college was founded in 1450. In respect of the general plan, especially the feature of the central pillars at the east end between the choir and retro-choir, the structure resembles Glasgow Cathedral built a hundred years before. But in the decorative character of the carvings Roslin Chapel has no counterpart; their prolific variety is extraordinary. The "Prentice Pillar," according to a legend, was executed by a youth while his master was absent in Rome, and on his return, becoming jealous, the master killed his prentice.—The illustration of the church at Katwijk is interesting as an example of modern architecture in Holland.

Fires in Old Houses.

MR. S. CHEETHAM, of Rochester, writing to the "Standard" with reference to the recent fire at Euston Hall, says that a few years ago in his own residence smoke was noticed issuing from a crack where no smoke should have been. On investigation it was found that a brick had dropped out of the old central chimney-stack at the point where the flooring of the attic-storey joined the chimney, and allowed the smoke to pass between the flooring and the ceiling of the room below. This had evidently been going on for some time, and if during that time a fire had occurred in the chimney there can be little doubt that there would have been a serious conflagration. Mr. Cheetham suggests that in old houses it may be well to ascertain that the chimneys are sound at

the point where the floors touch them. If the mortar has become unsound, bricks sometimes drop out. He introduced into one of his bedrooms a modern firegrate in which there was no intervening space between the fire and the hearth. The cement-bedding was not sufficiently thick, and in consequence the new grate set fire to the old wooden beam on which it rested. The moral of this is that great care should be taken in fixing new grates in old houses.

The Düsseldorf Exhibition.

A GREAT exhibition of German industry and art will be opened at Düsseldorf, on the Rhine, on May 1st. Throughout the German Empire Düsseldorf is known as the "garden town on the Rhine" on account of its splendid public gardens and its magnificent surroundings. The exhibition will illustrate the development of German industry since 1880. In that year the first exhibition was held at Düsseldorf, and then electricity was represented by a small railway and twelve electric lamps. This year electricity will be everywhere in evidence. The exhibition will cover 150 acres of land, and will be bounded by the Rhine and by the Hofgarten. There will be twenty-five sections, including mining, wood and furniture, fancy goods, clothing, agriculture, building and arts and crafts. The many exhibits will be housed in structures, not uniform in design, but all of some architectural merit. The art gallery will remain standing after the close of the exhibition. The exhibition will remain open until October 20th.

Spirals in Architecture and in Shells.

MR. T. A. COOK in an article in the "Monthly Review" recalls certain suggested resemblances between some of the famous spiral staircases and the spiral curves of certain shells. In the wonderful staircase in the wing of François I.'s Château de Blois in Touraine the curve of the unknown architect's spiral is identical with that of *Voluta resperitilio*. The Scala del Bovolo, in the Palazzo Contarini, Venice, similarly finds for its exquisite rising spiral of light archways a model in Nature in the *Scaloria scalaris*. The Escalier de la Reine Berthe at Chartres exhibits the delicate exterior of the ascending helix of *Mitra papalis*. The spiral in stone may by itself be an artistic failure, as Mr. Cook points out is the case in the stone spirals of the Palais de Justice, Rouen, or the twisted screw spire of Chesterfield.

Richmond Hill View: The Two Bills.

MR. GERALD MAXWELL sets forth very precisely the present condition of the Richmond Hill view problem. He explains that the object of the Richmond Hill (Preservation of View) Bill is diametrically opposed to that of the part of the London County Council (General Powers) Bill which deals with the purchase of the Marble Hill estate. The object of Lord Dysart's Bill is "to settle the lines on which the Dysart estates on the Surrey side of the river may be developed." That is to say, Lord Dysart seeks power to build upon some 200 acres of Lammas land which borders the river on the Surrey side. The object of the London County Council Bill is to prevent a further development of building on the Middlesex side. There can be no question that it is desirable to save the Marble Hill estate from the hand of the speculative builder, and only £10,000 is now required to complete the purchase money. But is it so certain that Lord Dysart's scheme for building on the opposite bank can be made acceptable? Mr. Maxwell continues: "If Lord Dysart wishes to preserve one of the most beautiful landscapes in the whole course of the Thames, he will dedicate to the public that portion of the Lammas fields which lies between the wooded heights of Richmond Park and the Teddington reach of the river. And as this is entirely in the parish of Ham, it would be a direct compensation to the holders of Lammas rights. But the loss of this glorious panorama is by no means all that will follow from the proposed 'development' of the Dysart Surrey estates. Granted permission to enclose the Lammas fields, Lord Dysart may hand over to the builder the entire frontage from Half Mile Point down to Twickenham Ferry. There is nothing at present in the Richmond Hill (Preservation of View) Bill to prevent the building

line from extending round the curve of the river opposite Eel Pie Island; and the fields at this point form a salient feature in the view from the Terrace. To be sure, it is said that Lord Dysart intends to give a wide inward sweep here to the conceded riverside land. But it will have to be a very much wider sweep than that which has been recently staked out if it is to preserve the view intact."

WESTMINSTER ABBEY AND THE OFFICE OF WORKS.

A SIGNIFICANT REMINDER.

IN preparation for the coming Coronation the Office of Works is once more about to be turned loose, as it was in 1887, into the Abbey Church of Westminster," says "E. H. W." in a letter to the "Times." He therefore thinks the moment opportune for invoking aid against a repetition of the kind of wanton havoc which was played in the church fifteen years ago. Three of the grosser outrages then perpetrated deserve to be specified:—

1. On the north side of the sacrum are three magnificent tombs with lofty canopies. They are some of the best specimens of their class in existence, and date from the late thirteenth or early fourteenth century. One of them is the tomb of Aveline, Countess of Lancaster. This figure was shamefully ill-used in 1837, when large fragments were broken off it. Some of these were lying by the side of the effigy when the Abbey was reopened to the public.

2. Abbot Richard de Ware, who was elected in 1258, shortly afterwards visited Rome, where he stayed two years. Thence he brought a quantity of materials, including porphyry, palombino and serpentine for the paving of the sacrum in mosaic. This exceedingly fine example of *Opus Alexandrinum* was constructed by an Italian workman, Odericus, who accompanied the Abbot to England. Obviously, nothing could have been easier than to cover Abbot Ware's interesting pavement with a few planks while the works connected with the 1887 Jubilee were in progress. This simple precaution being neglected, the mosaic was badly smashed in various places, apparently by tools and scaffolding being flung down upon it from a height. The largest and worst of these injuries can be easily traced on the south side, a few feet in front of the portrait of King Richard II.

3. The worst and most wanton piece of vandalism was the treatment accorded to the Coronation Chair. Before 1887 its general colour was that ashy grey so characteristic of very ancient wood, while on various parts of its surface were still to be found traces of its original ornamentation in gilded gesso. In preparation for the Jubilee the chair was smartened up by an ordinary workman with a coat of dark-brown polish—a process which obliterated the remains of the antique decoration, and imparted to the venerable relic a spick-and-span look, reminiscent of Wardour Street rather than of Westminster.

Of minor injuries to the fabric of the church there were many, including a number of chips and scratches (as of hob-nailed boots) plainly visible on the triforium arcading and on the diaper-work of Henry III.'s walls.

"A long and bitter experience of the ways of the Office of Works shows that it is not fit to be trusted with the charge of historic monuments. Is it asking too much to demand that nothing shall be done during the next three months to the fabric or furniture of Westminster Abbey without the consent of the accomplished surveyor to the Dean and Chapter, Mr. Micklethwaite?"

In answer to the foregoing statements Canon Robinson gives the assurance that considerations of convenience and seating accommodation will not be allowed to weigh against the permanent interests of the fabric. "It may be safely said that the interference with the church will be less on this occasion than it has been on any similar occasion in the last two centuries. . . . For many months Lord Esher has been in communication with Mr. Micklethwaite, whose name is, I believe, a sufficient guarantee to all ecclesiastical antiquarians that the interests which they are concerned to defend shall be jealously watched."

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THE FRAMJEE DINSHAW PETIT PARSEE
SHAPOORJEE N. CHANI



"INK-PHOTO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

Sanatorium, CUMBALLA HILL, BOMBAY.
J. J. M.S.A., Architect.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, April 16th, 1902.



CHURCH AT KATWIJK, HOLLAND. H. J. JESSE, Architect.



ROSLIN CHAPEL, SHOWING THE "PRENTICE PILLAR." Drawn by EDGAR MITCHELL.

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IDEAL PLUMBING.—IV.

By G. A. ALLAN, Plumbing Instructor, Trades Training School.

(Continued from p. 92, No. 372.)

THE water-supply of a house is one of the most important matters connected with its habitability; so much so that in the London Public Health (1891) Act one of the "nuisances" rendering a house unfit for human habitation is the absence of the prescribed water fittings.

In towns and places where the water is supplied from main pipes the internal arrangement of the pipes and fittings is all that needs consideration. The pipe conveying the water from the main to the house is called the "service." The part which ascends through the building to the cisterns and draw-off taps is called "the rising main." This latter pipe should be provided with a screw-down stop-cock below the ground level, so as to be beyond the influence of frost, with a draw-off tap just above the ground level for emptying during frosty weather.

All water pipes inside of a building should be fixed on boards attached to internal walls or ceilings, and should be in full view. This is the American custom, and has much to recommend it. In the large cities of the North-west, where the thermometer occasionally registers 62 degs. of frost, there are very few burst pipes for plumbers to repair, nothing like so many in the whole winter as occur in London during one short frost. The fact that water pipes buried in the plaster of external walls provide profitable employment for a large and deserving class of jobbing plumbers appears to be the only reason for perpetuating such an absurd system.

When it can be arranged, the kitchen range should be fixed at one side of the wall between the kitchen and scullery, and the scullery sink at the other side. The wall at the back of the range will not often be so cold as to allow the contents of a pipe fixed against it to freeze even in the most severe winters. The rising main may then be run up behind the sink with a draw-off tap for constant service. This draw-off tap will serve to empty the pipe above it, and by leaving it open when the water is shut off from the house, even if the water remaining in the pipe freezes (which is extremely unlikely at the back of the kitchen range), it is most improbable that the pipe will burst. Of course, the rising main will not be emptied by simply shutting off the water and opening the draw-off tap. Air must be admitted at the top. This is most easily done by running off enough water to allow the ball of the ball-valve to be lowered and so open the valve and admit the air. The rising main supplies the different cisterns. One cistern of galvanized iron should exclusively supply the water for flushing the water-closets and slop-sinks. Another similar cistern should supply the hot-water apparatus. For domestic use, cooking, &c., the cistern should be of white-glazed earthenware. All the cisterns should have wooden covers and be fitted with overflow pipes, the cover of the stoneware cistern being ventilated. Provision should also be made for emptying this cistern, as it should be washed out frequently. The other cisterns need cleaning out occasionally, but not so often.

The cisterns should be placed in an airy, light, well-ventilated room, in which should be some arrangement for warming in winter-time, so as to prevent the frost from damaging the cisterns, or the pipes immediately in connection with them. A screw-down stop-cock should be inserted into each branch of the rising main supplying the cisterns, so that each cistern may be shut off separately for any purpose, without interfering with the others. A similar stop-cock should be fixed near the outgo of each cistern in the down service so as to shut off any service without having either to empty the cistern or to rely on a plug inserted into the outgo inside the cistern. To enable the down service to be emptied when the last mentioned stop-cock is closed and the lowest bib on the service opened, a piece of pipe should be branched into the service below the stop-cock and carried higher than the side of the cistern (see Fig. 18).

By running water pipes only on internal

walls the chances of their being burst by frost are reduced to a minimum, because, even in the severest weather, it is not usual for the temperature of an inhabited house to fall so low as to freeze water in the pipes. By running them on face boards in full view in the kitchen, scullery, bathroom and water-closet the damage done by a burst is very much reduced and the pipe can be repaired and replaced without any "making good" of plaster, paper, paint or tiles. By arranging all the water pipes so that they can be emptied when the water is shut off during the night, or when the house is closed, the chance of damage by frost is reduced to a minimum.

In water fittings, as in the whole of the sanitary arrangements, the simplest are the best. The majority of the ingenious but complicated inventions, mostly designed to remove fancied defects, should be studiously avoided, especially in the country or in any position where skilled labour is not readily available. The fittings though simple should be of the best quality, of heavy brass or gunmetal, by recognised makers who charge a fair rather than a cutting price, and who have reputations they value. The draw-off taps over sinks should be of the ordinary screw down pattern; the supply fittings for the baths and lavatory basins must be adapted to the flushing-rim style of supply.

Lead is the material of which water pipes are constructed in England. In America iron has

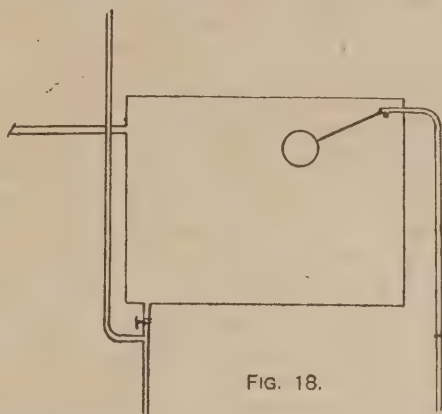


FIG. 18.

largely superseded lead for water pipes as well as for soil and waste pipes. Some American writers, as J. C. Bayles, condemn lead in unqualified terms equally for both purposes. Bayles also condemns galvanised iron pipe, preferring the plain black barrel, which he says is the very best material of which to form water pipe, and which will last twenty years before needing to be renewed.

Except in the case of soft water, lead is as good a material as any other of which to form water pipes. In the case of soft water, tin-lined lead pipe and tin-lined iron pipe are useful, also copper pipe; tin being affected very slightly, and copper not at all, by the soft water.

In country houses where there is no public service of water a supply must usually be found in the grounds attached to the premises, and wells or streams are then the most frequent sources from which the water is obtained.

Wells are of two classes, shallow and deep. One writer has explained that all wells less than 50ft. deep are shallow, while wells more than 50ft. deep are deep wells; but in the usual acceptance of the words as applied to wells "shallow" and "deep" have no necessary connection with the number of feet that the surface of the water is below the ground level. Shallow wells are such as yield water which has fallen in the immediate vicinity and has percolated through the earth into the well. Shallow-well water is the ground water lying on the uppermost impervious stratum. Deep-well water is found by digging or boring through the uppermost impervious stratum to the water that is beneath. Artesian wells yield deep-well water though the water will frequently spout into the air.

Speaking generally, shallow-well water is dangerous to use and should be avoided whenever possible. Deep-well water is good. Of course the deep-well water originally fell on the surface of the earth, but it has become thoroughly

filtered and purified before reaching the underside of the clay or rock, which retains what is called the ground water.

Water may be drawn from wells in the old primitive manner by means of a windlass and bucket. It is usual, however, to employ a pump. In deep wells the pump must be of the "lift and force" variety, fixed on a platform 20ft. above the lowest level to which the surface of the water sinks. The pump may be worked by manual labour or by a windmill, or by a steam-, gas-, oil- or hot-air engine.

In the cistern, which will of course be at the top of the building, a float should be attached to one end of a chain; which chain, passing over a pulley, has at its other end a weight hanging in front of a scale, the scale being as long as the cistern is deep. When the cistern is quite empty the weight will be at the top of the scale; when the cistern is full, the float having risen as the cistern filled, the weight will be at the bottom of the scale; when the cistern is partly full the position of the weight in front of the scale will indicate how much water the cistern contains.

When the pump is worked by manual power it will be better to have cisterns on different floors of the building, as it will then be unnecessary to pump water to the top of the house which is to be used cold in the scullery, dairy, laundry or stables. The windmill is a cheap and efficient motor for pumping in most situations, though when placed too near the building the appearance of many houses and institutions has been spoiled by it. All the attention that the windmill needs is to be put in or out of action, as water is or is not wanted and as there is wind; and to be kept very carefully oiled. A steam-engine is not suitable for pumping when power is not wanted for any other purpose. When an engine is required for the general work of the establishment it may appropriately do the pumping also, but to have to light a fire and get up steam only to pump would, under most conditions, be a waste of energy. Where gas is available, either from the public mains or from a private installation, a gas-engine is the best motor that can be used. It can be started at a minute's notice with a minimum of trouble; and as soon as the pumping is done the engine is stopped and the consumption of gas at once ceases. It can easily be arranged that when the cistern becomes full the counterweight shall shut off the gas and so automatically stop the engine. Where gas is not to be had, an oil- or hot-air engine will be best. These, like the gas- or steam-engine, or the windmill, can also be used for other work. But when the total amount of work to be done will keep an engine at work all day the steam-engine will be found most economical.

If the source of water-supply be a stream instead of a well the water will generally need to be filtered before being used, though it is usual to pump it first. From a stream, as from a well, the water may be pumped by means of a windmill or by a steam-, gas-, oil- or hot-air engine. If there is a sufficient fall in the stream there is also the chance of raising the water by means of a hydraulic ram, or of working the pump by means of a turbine or water-wheel.

If the water be potable as taken from the stream, and there is sufficient fall—10ft. is preferable—a hydraulic ram will give good results and needs practically no attention. A large overflow pipe discharging into the eaves-gutter will allow the escape of surplus water when the cistern is full. If the water as taken from the stream is not potable, but needs to be filtered, one or more filter-beds can be formed near the stream and the filtered water forced up to the house cistern by a pump worked by a turbine or water-wheel actuated by the stream.

In some cases a pipe is led from a stream at a higher elevation than the house supplied, and the cistern filled by gravitation; or the cistern may be omitted and the house supplied on the constant system.

Where there is an abundance of indifferent water and a small supply of water of good quality, the latter can be used exclusively for drinking and cooking, and the former for washing, cleaning, flushing and general domestic purposes.

Rainwater, in cities, is turned into the sewers. The roofs of the buildings are so foul that the water would be useless without filtration, and the amount of soot and dirt is so great that the

filters would soon be clogged. In the country the roofs are not so foul, most of the filth being birds' droppings. By arranging the rainwater stack pipes so that there shall be as few of them as possible, and attaching to each a Roberts' patent rainwater separator, the first rain which falls washes the roofs and runs to waste, while the balance is stored for use. A very large butt is sometimes fixed outside the scullery or laundry on a stand of the necessary height, with a pipe leading through the wall fitted with a tap over the sink. Occasionally a brick tank is built above ground and rendered inside with cement. But the best way of storing rainwater is in an underground cistern built of brick set in cement compo, of circular form, the bottom being paved with flagstones and the top being built bottle-shaped. The whole of the bottom and sides should be backed with well-puddled clay. In constructing it, the ground is excavated to a depth of 2ft. deeper than the inside of the tank is to be, and 18in. of well-puddled clay is laid over the whole of the bottom. The excavation should be 4ft. more in diameter than the inside of the completed tank. This allows a 9in. wall, with 18in. of puddled clay behind it all the way up. On the puddled clay first laid in the ground two layers of flagstones breaking joint should be laid to form the bottom of the tank. The wall should not be built up at any place more than 1ft. higher than any other place, and the puddle backing to the wall should be put in in layers of not more than 1ft. thickness. Each layer must be well worked into the layer previously laid. This work requires particular care, because if there is a defect the brick wall prevents it being reached and rectified. A pump is fixed near the sink with the suction-pipe leading to the bottom of the cistern and terminating about 6in. from the floor. By this means neither scum nor sediment can be drawn into the pump.

These underground cisterns are beyond the reach of frost, and keep the water cool in summer. They should be well protected at the manhole made for gaining access to the interior, and they should be cleaned out annually, at the time of year when the water in the cistern is lowest, so as to waste as little as possible.

When it is considered desirable to filter all the water supplied to a house, hotel or institution, sand is the best filtering material to use. When the water is taken from a stream the filter-beds can be formed on one side and the water filtered before it is pumped as previously explained. When only the drinking water is to be filtered a Pastur filter for screwing on to a tap should be used. There are only three efficient filters made. They are all of the candle type. They consist of cylinders of unglazed earthenware through the pores of which the water is forced by pressure. The earthenware is specially prepared. This is the only form of filter that retained all the germs of typhoid fever from some specially-infected water which was experimented with. The ordinary type of filter depending for its action on charcoal or chemical substances has been proved to be not only useless but harmful. For though it purifies water to a large extent while new, before it has been in use for any length of time it imparts more organisms to the water than it intercepts, and it is not certain to intercept the specific germs of disease even when new.

Closely associated with the question of water-supply, but not usually connected with plumbing, is the provision of hydrants for the connection of fire-hose in large houses, &c. Though less urgently required in towns where there is a good municipal fire brigade, these are eminently desirable in all positions, and are absolutely essential in the country. A large cistern in a tower, or just under the roof, should be kept exclusively for fire-extinguishing purposes. From this should descend one or more main pipes, generally down the stair wells, with branches where necessary along the passages, corridors and galleries. With a hydrant on each floor on the staircases, and enough hose connected to reach into the centre of any room near, the house will be well protected against fire. It will be no use, however, to fix a complete fire apparatus unless the inmates of the building are trained in its use. This should be frequently done both at set drills and on false alarms. And

twice a year, when the house is being cleaned, all the hydrants, valves, hose, couplings, unions, &c., should be overhauled by an expert.

The main supply to the hydrants should be kept away from all external walls and cold positions and carefully wrapped in many thicknesses of felt, as this is a pipe which cannot be emptied in frosty weather. The pipes and hydrants may be cased in the staircases; and it will not be beyond the ability of architects to work the treatment of the casings of the pipes into the general scheme of decoration in the building.

(To be concluded.)

DEFECTS IN THE "MODEL" BY-LAWS.

THE Incorporated Association of Municipal and County Engineers recently held a meeting at Birmingham, when a paper on "The Filtration of River Water" was read by Mr. A. J. Jenkins, deputy-borough surveyor, Burton-on-Trent, and another on "Local Government Building By-laws" by Mr. F. C. Cook, engineer and surveyor, Hinckley.

Mr. Cook devoted the first part of his paper to a consideration of the "model" by-laws, and while agreeing that some such guide to local authorities was necessary, deprecated the hard-and-fast rules which seemed to govern the officials at the Local Government Board in dealing with suggested deviations from them on the part of local authorities. He criticised the "all or none" attitude of the Local Government Board, pointing out, for instance, that though if a local authority desired to make by-laws as to the height of rooms the Local Government Board would assuredly insist upon their model clause being entirely adhered to, yet they appeared to have no objection to the matter being left practically unregulated. It could not, he said, be denied that the general effect of the adoption of by-laws based on the model code had been to considerably raise the standard of building throughout the country, but it was questionable whether, in the case of the smaller towns, they did not unnecessarily retard building operations to their detriment, and in the larger towns the increased cost of building, added to the high price of land, rendered almost prohibitive the ideal of one family occupying one house, and resulted in the overcrowding which was such a blot upon the sanitary condition of some of our large cities. Amplification or modification of by-laws could be secured by a private Act of Parliament, but, unless an Omnibus Bill were in contemplation, that was obviously beyond the power of, at any rate, the smaller districts. Moreover if the by-laws issued by the Local Government Board were to be regarded as a "model" series it should not be possible to get behind them by a private Act, and if modifications and amplifications so obtained were fit and proper powers for a local authority to enjoy, they should be within the reach of every town without the trouble and expense of promoting a private Bill. Mr. Cook suggested three main lines of reform:—A leveling-up by the compulsory adoption of modern by-laws in districts at present behind the times in this respect; the formulation of a code of model by-laws confined to those points which experience has shown to be essential; and the empowering of local authorities to make supplementary by-laws and regulations, specifying what may be regarded as matters of detail, and containing provisions specially suitable for the needs of different localities.

Mr. John Price, who contributed to the ensuing discussion, said that probably no town in the United Kingdom had worse by-laws with regard to ventilation at the rear of buildings than Birmingham, but they were endeavouring to overcome the difficulties in the Omnibus Bill.—Mr. Henry Price, the city building surveyor, mentioned that at the present time Birmingham was, with regard to open spaces at the rear of buildings, acting under the by-laws of 1876, and consequently had no power to compel the provision of any open space at the rear of a good-sized villa. He remarked that the Local Government Board had latterly been making much greater concessions than ever before,

New Patents.

These patents are open to opposition until May 19th.

1931.—Shaping Tool for Door Stiles.—3,048. A. J. NORRIS, 63, Mildmay Grove, London, S.E. The tool is mitre-shaped and has cutters on the head and base as well as on the periphery. It is attached to a rotary spindle and is specially intended for forming the shoulders of door stiles.

Non-Conducting and Anti-Corrosion Composition.—5,374. W. BRIGGS, 13, Panmure Street, Dundee. This composition consists of bitumen or pitch, 50 per cent; lime or whiting, 20 per cent.; fine sand or Portland cement, 20 per cent.; and flake mica, 10 per cent. These ingredients are melted in an iron cauldron and mixed well together.

Lime and Cement Kilns.—6,623. I. ISSERLIS, 12, Rostionnaja, Kieff, Russia. In order to combine all the advantages of the generator kiln and that of the Hoffmann furnace, and avoiding their disadvantages, two parallel longitudinal walls and two parallel rows of generator or gas hearths are arranged in immediate connection with the shaft.

Cement Manufacture.—6,800. G. W. BUTCHARD, Burch House, Rosherville; A. A. BUTCHARD and J. A. BUTCHARD, both of Ellerslie, Gravesend; and H. GIBSON, 9, Great St. Helen's, London, E.C. The slurry is kept in a round tank fitted with a special form of mixing and stirring apparatus, this consisting of a number of depending rakes fixed to revolving horizontal arms: the object being to prevent the slurry settling and so keep it ready for use. The upper part of the rotary kiln is reduced in diameter by the insertion of a tubular lining, so that the downward motion of the slurry is slow at first and its drying rapid. To prevent choking, the mouth of the pipe through which the slurry is pumped into the kiln is made conical instead of cylindrical.

Blast-Furnace Slag Cement.—10,857. A. M. CLARK, 53, Chancery Lane, London (communicated by Fellner & Ziegler, Machine Works, Kreuznacherstrasse, Bockenheim, Frankfurt-on-the-Main). The molten slag is fed on to a rapidly revolving cone or plate, where it is dispersed by centrifugal force and finely divided so that its particles are brought into contact with sufficient air to cause the complete combustion of all deleterious elements, such as sulphides, &c.

1902.—Water-Closet Seats.—2,396. M. J. ADAMS, 72, Park Lane, Leeds. The seat is made of wood but has the "soiling portions"—those which are more readily contaminated by the user—made of porcelain, earthenware or similar material.

The following specifications were published on Thursday last, and are open to opposition until May 26th. A summary of the more important of them will be given next week. The names in italics are those of the communicators of the inventions.

1901.—5,556, BROOKES & BARNES, kilns. 5,799, BRITISH CHARRIER WOOD CARVING CO., LTD. (*Charrier*), wood-carving machines. 6,167, CHATWOOD, locks for safes and strong rooms. 6,742, BEAUMONT, door locks. 6,982, MORTON & BRADSHAW, apparatus for removing or recovering fusible matter adhering to stones, blocks, &c. 7,102, BUTT & STREADER, vehicles for carrying timber. 7,447, GREENHILL, vertical bar metallic fencing. 7,472, WILLIAMS, pipe T's and elbows. 7,512 Osgood, taps. 7,814, LOSS, roofing tiles. 7,815, LOSS, roofing tiles. 8,433, LE MAITRE, window sashes, casements, &c. 8,575, HARGREAVES, door knobs. 8,619, WATROUS, water-closet valves. 8,767, DOULTON, water-closet fittings for connecting supply pipe to basin. 8,894, GOLBY (*Hass*), self-closing valves. 9,544, LUTHER, metal sash-frames for windows. 9,662, FRANCKE, double doors. 9,742, ASHWORTH, bricks. 10,021, BEAUMONT, coin-freed locks for lavatories. 10,388, SANER, corrugated metal flooring. 10,417, OBENLAND, hand planes. 10,622, TIMOFEEFF, pavements. 10,865, LONES, HOLDEN & LONES, manufacture of white pigment from zinc. 11,231, HALBACH, stocks and dies. 16,127, SEYMOUR & LOWENTHAL, sheet-metal frames. 21,806, GRIFFITHS, cranes.

22,884, HUXLEY, valves. 24,683, BERRY & JOHN BENNET LAWES & CO., LTD., cements or plasters and manufacture of bricks, tiles, &c. 25,177, FOSS & LINCOLN, valves. 25,261, WHALLEY, rainwater troughing for buildings. 26,066, PEARMAN, door-fasteners.

1902.—178, RANSOME, means for coupling metal bars in re-enforced concrete buildings. 307, COMSTOCK, window-sash fastenings. 1,489, BIRCH, drains.

Keystones.

Mr. Ernest Runtz has returned from Ceylon greatly benefited by the trip.

Mr. Henry Price has been appointed architect to the Manchester Corporation.

Architectural Copyright.—The law of artistic copyright in France has now been extended to include architectural works.

A Memorial Window to the late Mrs. Colston and her son has been erected in the parish church of St. James, Southbroom, Devizes.

In St. Olave's Church a new chancel screen has been erected to the memory of the late Mrs. Ingle, wife of a former rector of the church, and her sister. The work has been done by Messrs. Harry Hems & Sons.

Devon and Exeter Architectural Society.—A meeting of this Society was held last week, when Mr. Arthur S. Parker, A.R.I.B.A., read a paper on the building by-laws of Plymouth, our report of which we are obliged to hold over till next week.

Mr. Charles Kirk, of Sleaford, died recently. He was the surviving partner of the firm of Kirk & Parry—now merged in Kirk, Knight & Co.—builders and contractors, of Sleaford. Before the day of county councils the deceased held the post of surveyor for Kesteven.

Institute of Journalists' New Building.—The foundation-stone of the new hall being erected for the Institute of Journalists at the corner of Bridewell Place, in Tudor Street, E.C., was laid last Saturday, Mr. Henry L. Florence, F.R.I.B.A., is the architect, and Mr. J. Carmichael is the builder.

The New Public Baths at Walham Green, which have been erected by the Fulham Borough Council from the designs of Mr. H. Dighton Pearson at a cost of about £620,000, were opened last week. The establishment includes three swimming baths, eighty-four private baths, and a washhouse containing stalls for sixty-six washers.

An Iberian Temple Discovered.—Dr. Sieglin, Professor of Ancient History at the University of Berlin, has discovered during his recent tour in Southern Spain what is probably the oldest temple of the ancient Iberians, at the confluence of the rivers Odiel and Rio Tinto, near Huelva. The temple was dedicated to the Goddess of the Lower World, and is connected with two caves which are filled with debris.

Building Trades' Gift to the Nation.—Sir Theodore Martin states in the "Times" that he visited the Bisley houses on March 28th and found several large buildings which had been completed for many months, but without furniture, and the whole place utterly deserted. There was, however, a board stating the title of the homes and the address of the Soldiers' and Sailors' Help Society, to whom he now addresses several pertinent questions as to the future of the buildings.

Sheffield Society of Architects and Surveyors.—The annual meeting of this Society was held last Thursday, when the annual report was received. Reference was made in it to the action taken by the Society in regard to the new by-laws which the Highway Committee of the Sheffield Corporation had prepared for submission to the Local Government Board, and the Council hope that their recommendations will result in a workable set of by-laws being adopted. After the report had been approved the officers for the ensuing session were elected, Mr. P. Marshall, F.S.I., being elected president. The Society's prizes for measured drawings were presented to Mr. G. R. Morris and Mr. D. B. Jenkinson. The statement of accounts shows a balance in hand of £64.

New Poor Law Offices at Birkenhead are being erected from plans by Mr. Edmund Kirby, architect. The contractor is Mr. W. H. Forde, and the clerk of works is Mr. W. Hughes.

The School of Art Woodcarving, South Kensington, has been reopened in rooms in the new building of the Royal School of Art Needlework in Exhibition Road. Some of the free studentships are vacant and application may be made for them.

Goethe Statue for Rome.—Professor Gustav Eberlein, sculptor, has prepared his model of the Goethe statue, which the German Emperor has signified his intention of presenting to the city of Rome. A Corinthian capital serves as pedestal to the poet's statue, the plinth being decorated with three groups symbolising Goethe as dramatist, poet and philosopher.

A Large Hotel for New York.—Another great hotel is to be added to New York's already imposing list. Mr. John Jacob Astor proposes to erect, at a cost of £1,000,000, a great structure in the Upper Broadway district. It will closely resemble the Hotel Cecil, but will be somewhat less lofty and without a courtyard. A roof garden is included in the design.

A New Board School at Gatshead has been erected in Victoria Road for 300 scholars. The new school is a one-storey building (intended for children in the lower standards) consisting of six classrooms and a large central hall. Mr. W. H. Dunn was the architect, and Mr. Thomas Hunter, of Washington, the contractor. Mr. Thomas Rule did the plastering, Mr. Charles Nicholson the slating, and Messrs. Allinson & Son the plumbing. The hot-water apparatus was supplied by Messrs. Richardson & Co., of Darlington.

Stratton Audley Church has been restored at a cost of £1,000. The building has been put in thorough order by Messrs. T. Grimsley & Son, Bicester; the bells having been re-hung by Messrs. Webb, of Kidlington. The chancel roof has been taken off and a new parapet built, the interior having undergone a course of re-decoration and a new floor provided. New pinnacles have been added to the tower, whilst a lightning conductor has been fitted to ensure safety. The parapet walls have also been thoroughly repaired.

Truro Cathedral is about to be enriched by a fine example of Tinworth's bas-relief work in terra-cotta. The artist, who was first brought into note by Sir Henry Doulton, of the Lambeth potteries, executed a work 8ft. 5in. long by 3ft. 2in. in height called "The Way of the Cross," and the owner, Mr. Frank Walter Bond, of Wargrave Park, Berkshire, who is of Cornish descent, has presented it to the Cathedral of Truro. It contains about sixty figures, and is one of the best examples of Tinworth's handicraft. "The Way of the Cross" will probably be placed in a prominent position near the west end of the nave.

A Cottage Hospital at Kilsyth has been erected. It is built of red-pressed bricks, slated with green slates, and capped at the ridges with red tiles. The front gables are filled in with half-timbering, with the recessed part between them roofed over and formed into a verandah, with pillars and broad arches above and wood-railing below. The contractors were:—Masonry, Mr. William Reid, Larbert; joinery, Mr. John Peter, Kirkintilloch; slating, Mr. D. McNair, Falkirk; plasterwork, Messrs. J. & A. Williamson, Kilsyth and Kirkintilloch; and plumbing, Messrs. W. T. Forrester, Stenhousemuir. The architects were Messrs. M'Luckie & Walker, of Stirling.

The Eastbourne Technical Institute.—Mr. P. A. Robson, whose plans for the proposed Technical Institute at Eastbourne were adopted, has written to the Technical Committee stating that he is prepared to obtain a builder's tender for £25,000, to include all fees and both buildings (the Institute and the fire station), or for £20,000 with 10 per cent. margin. It will be remembered that the lowest tender was £34,000, and as this was nearly double what was originally estimated the scheme was defeated by an overwhelming majority. It was anticipated that the scheme would have to be completely re-modelled, and the architect's offer opens another way. He stipulates that he should be allowed to employ his own quantity surveyors.

A Coronation Exhibition is to be held shortly by Messrs. Doulton at their Lambeth works; a Tinworth Room will be a prominent feature.

In St. Lawrence Parish Church, Ramsgate, a stained-glass east window has been erected as a memorial to Queen Victoria, who as a girl worshipped there. The window is from a design by Mr. A. O. Hemming.

The Plans of Mr. J. M. H. Gladwell, architect, of Boston House, New Broad Street, E.C., have been accepted for the alterations to be carried on at the Buckfield Hotel, Snaresbrook. He will also be responsible for alterations and additions to the Victoria House, Burdett Road.

Copies of "Builders' Journal" Wanted.—The publisher will be glad to send a copy of the current issue of THE ARCHITECTURAL REVIEW in exchange for a copy of THE BUILDERS' JOURNAL for March 14th, 1902, or for March 21st, 1900.

Memorials at Shere.—A stained-glass memorial east window and a memorial lych-gate at the old church of St. James, Shere, have been dedicated. The glass is the work of Mr. James Powell, of Whitefriars, and the lych-gate is of local construction, after the design and erected under the superintendence of Mr. Lutyens.

A New Nurses' Home at Aston has been erected at Gravelly Hill in connection with the workhouse. Messrs. C. Whitwell & Son, of Birmingham, were the architects, and Mr. T. Johnson, of Great Brook Street, was the builder. The cost has been about £9,900. It occupies a position facing Feltham Road, to the south of the infirmary buildings. Accommodation is provided for upwards of forty nurses.

New Municipal Offices at Craws.—The Crewe Corporation, being unable to accept the London and North-Western Railway Company's price of £1 per yd. for land near the Market Square as a site for the new municipal offices, have decided to pull down their present suite of offices and the Market Tavern alongside and erect municipal buildings on their own freehold at a cost of about £12,000.

A New Board School in Devonport has been erected in Trelawney Avenue to accommodate 900 scholars. Messrs. Hine & Odgers, of Plymouth, were the architects. The cost is about £11,000. Mr. W. Blake was the builder, and Mr. G. Sleeman acted as clerk of works. Baylis's system of ventilation has been used throughout the building, which is warmed on the high-pressure system, the apparatus being fitted by Messrs. Longbottom, of Leeds. The walls outside are faced with select local red bricks, and the roof is covered with Delabole slates.

A New Fire Station at Glastonbury has been erected at a cost of about £1,200 in George Close, and comprises a large engine-house, secretary's office, stabling for two horses, yard for drilling and other purposes, store sheds and sanitary offices. But the feature of the building is a tower 40ft. high, specially built for drying the hose. The base of the tower is heated with hot-water pipes, which are also extended into the engine-house, in order to keep the men's clothes aired and dry. A roomy and conveniently-arranged house is built on to the station for a caretaker. The whole block has been built, under the supervision of the borough surveyor, by Mr. D. Dunthorne, contractor.

Surveying and Sanitary Notes.

The Estate of the late T. J. Fife, surveyor, formerly of Whittington Avenue, Leadenhall Street, has been valued at £10,139 9s. 4d.

Brisco Estate, Hastings.—The Hastings Corporation have decided to purchase for £18,000 about 9½ acres of the Brisco Estate. The land is in the centre of the town, and is considered a suitable site for a winter garden and recreation ground or for new municipal buildings.

New Public Park for Manchester.—The Heaton Park estate has been bought by the Corporation of Manchester for £230,000. It comprises an important family mansion, standing in the centre of the park, which has an area of about 650 acres, entirely surrounded by a brick wall.

Engineering Notes.

Widening of London Bridge.—On Thursday last the construction of the temporary timber foot ways on each side of the bridge was begun.

A Proposed Mono-Rail to Brighton.—It is stated that Mr. Behr, the inventor of the mono-rail and the original promoter of the Manchester and Liverpool Electric Express Railway, which received Parliamentary sanction last session, has been commissioned by an influential syndicate to prepare plans for a new electric railway from London to Brighton.

Windsor and Maidenhead Light Railway.—An enquiry was held recently with reference to the proposed light railway between Windsor and Maidenhead. The scheme was supported by some of the residents and strongly opposed by landowners and others in the district. Sir Alexander Binnie detailed the varying widths of the roadway along which the railway would pass

from Windsor through Clewer, Dedworth and Holyport to Maidenhead. The Commissioners under the Light Railways Act at the close of the investigation said they considered that the case for the promoters had not been sufficiently proved, and they accordingly refused to grant the order.

The Institution of Civil Engineers held a meeting on April 8th, Mr. Charles Hawksley, president, in the chair, when it was reported that the Council had recently transferred eleven Associate Members to the class of Members, viz.: J. H. Barker, G. J. Bell, G. F. Burn, J. Ferguson, F. D. Fox, M.A., A. P. Friend, W. Kingston, B.E., C. Mayne, G. T. Nicholson, J. H. Rider and E. G. Rivers. The monthly ballot resulted in the election of fifty-two Associate Members, viz.: J. E. Acfield (Leeds), A. H. Alcock (Leeds), A. M. Arter, (London), W. L. Atkinson (London), W. A. A. Battle (Leeds), G. R. Blackburn (Baildon, Yorks), C. R. D. Borrett (London), H. Brodhurst (London), W. E. Bush (Birmingham), W. Carnegie (London) J. D. Cormack (London),

G. H. Corringham (Leeds), E. McLeod Dowson (Cairo), F. A. Drought (Southampton), J. W. S. Emerson (London), A. R. Gibbs (London), W. J. Gow (London), J. E. Greig (London), J. W. Griffith (Rosslare), W. J. Guyatt (Glasgow), W. H. Haigh (Cardiff), H. T. Hildage (London), R. F. Hindmarsh (Newcastle-on-Tyne), B. Howdle (Seacombe), B. Humprey (New Swindon), W. Hutchison (Glasgow), J. Irvine (Leeds), G. Jerram (London), H. Lapworth (Sheffield), C. E. Lloyd (London), J. T. Maxwell (East Indian Railway), A. Millar (London), W. M. Moylan (London), C. F. Murphy (Bolton), J. J. Niven (Edinburgh), J. S. Owens (London), F. C. R. Palmer (London), G. Porter (Worthing), W. W. Preece (London), J. D. Prophet (Cuba, W.I.), A. C. Rogerson (Horwich), C. E. H. Salmon (W. Africa), W. C. Shettle (London), R. C. Sikes (Great Western Railway), H. L. Smith (London), F. C. Taylor (Manchester), W. A. Thain (Cardiff), G. Ward (Birmingham), W. Watts (Penistone), J. B. Willis (Ilford), J. F. Wilson (Cape Colony), F. Wright (Malta).

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
April 17	London, S.E.—Works	St. Olave's Union Guardians	Newman & Newman, 31 Tooley Street, S.E.
" 17	Silsden, Yorks—Six Houses	Co-operative Society, Ltd.	R. Holdsworth, Secretary, Society's Offices, Silsden.
" 17	Salford—Stones for Headstones, &c.	—	Borough Engineer, Town Hall, Salford.
" 17	Portadown, Ireland—Parochial Hall	—	J. W. Walby, Architect, Portadown.
" 17	Sutton Scotney, Hants—Pair of Cottages	—	W. & G. A. Bell, Architects, Andover.
" 17	Ilkerton—Car Shed, Offices, &c.	Tramway and Electricity Committee	Borough Surveyor, Town Hall, Ilkerton.
" 17	Bunham-on-Crouch—Additions to Schools	School Board	Chancellor & Son, Architects, Odinstford.
" 18	St. Anthony's Point, nr. Falmouth—Coastguard Bldgs.	Admiralty	Director of Works Dept., Admiralty, 21 Northumberland Av., W.O.
" 18	Dewesbury—Branch Store, &c.	Pioneer's Industrial Society, Ltd.	Holton & Fox, Architects, Corporation Street, Dewsbury.
" 18	Hull—Car Shed	Corporation	A. E. White, City Engineer, Town Hall, Hull.
" 18	Ilkley—Masonry, &c.	Urban District Council	Surveyor, Council Offices, Ilkley.
" 18	Stainton, near Dalton-in-Furness—Church and School	—	J. W. Dickson, 2 Fair View, Dalton-in-Furness.
" 19	Gateshead—Hall	—	A. L. Armour, 16 West Street, Gateshead.
" 19	Glenbucklet, Aberdeen—Farm Offices, House	—	Jenkins & Marr, 16 Bridge Street, Aberdeen.
" 19	Haverfordwest—Water Closet, &c.	Union Guardians	D. E. Thomas, Architect, Victoria Place, Haverfordwest.
" 19	Lancaster—Alterations to Cottage and Farm Buildings	Streets Committee	Borough Surveyor, Lancaster.
" 19	Landore, near Swansea—Church	Rev. D. W. Morgan	E. M. Bruce-Vaughan, Architect, Cardiff.
" 19	Londonderry—House	J. Alexander	J. McIntyre, Architect, Letterkenny.
" 19	Ruilham, Great Yarmouth—Chapel	—	A. S. Hewitt, Architect, Bank Chambers, Regent St., Gt. Yarmouth.
" 19	Surbiton—Boundary Walls	Urban District Council	Surveyor, Council Offices, Surbiton.
" 19	Gelligaer, Wales—Repairs, &c., to Schools	School Board	James & Morgan, Architects, Charles Street Chambers, Cardiff.
" 19	York—Church Restoration	—	Boreham & Morton, 24 John Street, Sunderland.
" 19	Kendal—Two Shops, Billiard Room, &c.	Stretford Urban District Council	J. Bintley, 7 Lowther Street, Kendal.
" 19	Old Trafford, Manchester—Public Baths	—	E. Woodhouse, Architect, 88 Mosley Street, Manchester.
" 19	Edgeworthstown, Co. Longford—Convent Schools	Redruth Brewery Co., Ltd.	T. F. McNamara, 50 Dawson Street, Dublin.
" 19	Par Station—Additions, &c., to Hotel	—	H. W. Collins, Architect, "Waledredon," Redruth.
" 21	Bristol—Hall and Classrooms	Great Northern Railway Co. (Ireland)	Oatley & Lawrence, Edinburgh Chambers, Baldwin Street, Bristol.
" 21	Dublin—Houses	—	Company's Engineer-in-Chief, Dublin.
" 21	Wardhouse, Scotland—House	School Board	A. Taylor, Overseer, Wardhouse.
" 21	Gloucester—Infants' School	Hornsey Urban District Council	H. Medland, 15 Clarence Street, Gloucester.
" 21	London, N.—Firemen's Quarters & Fire-Escape Shed	Hammersmith Guardians	E. J. Lovegrove, Offices, Southwood Lane, Highgate, N.
" 21	Shepherd's Bush—Boundary Walls	Hammersmith Guardians	J. H. Richardson, 87 Finsbury Pavement, E.C.
" 21	Wormwood Scrubba—Boundary Walls and Railing	—	Giles, Gough & Trollope, 23 Craven Street, Strand, W.O.
" 21	Kilkeel, Co. Down—Additions, &c., to Church	Corporation	W. H. Stephens & Son, 13 Donegal Square North, Belfast.
" 21	Gellyrheina, Wales—Eight Cottages	Urban District Council	Manse House, Chapel Lane, Carnuffaith, Mon.
" 21	Glasgow—Tenements, &c.	—	F. B. Boston & Carruthers, 180 Hope Street, Glasgow.
" 21	Ilford—Lodge	Committee	H. Shaw, Surveyor, Town Hall, Ilford.
" 21	Kirkby Lonsdale—Houses	—	J. F. Curwen, 26 Highgate, Kendal.
" 21	Cwmpark, Cardiff—Chapel	—	J. Rees, Architect, Centre.
" 21	Lancaster—Remodelling, &c.	No. 3 Building Society	J. Greene, Architect, Meeting House Lane, Lancaster.
" 21	Llanharan, Wales—Twenty Cottages	Hammersmith Board of Guardians	Court House, Fencoe.
" 21	London, W.—Boundary Walls, &c.	W. Bowers	Giles, Gough & Trollope, 23 Craven Street, Strand.
" 21	Port Talbot—Business Premises and House	Llewellyn Brothers	G. P. Davies, Architect, Port Talbot.
" 21	Port Talbot—Business Premises	Gellydug Building Club	G. P. Davies, Architect, Port Talbot.
" 21	Maesycwmm—Twenty Houses	Urban District Council	G. Kenshole, Architect, Bargoed.
" 22	East Ham—Additions to Electric Tram near Station	School Board	A. H. Campbell, Surveyor Public Offices, Wakefield St., E. Ham, E.
" 22	Hull—School	Water Committee	School Board Office, Albion Street, Hull.
" 22	Lancaster—Water-Meter House	Town Council	Borough Surveyor, Lancaster.
" 22	West Ham—Road Roller Shed and Offices	School Board	Borough Engineer, Town Hall, West Ham.
" 22	Whickham, Durham—Additions to School	Dublin, Wicklow and Wexford Railway	J. W. Roundthwaite, 13 Mosley Street, Newcastle-on-Tyne.
" 22	Dublin—Stables, Tiles, Cement, &c.	West Ham Corporation	Mr. F. Keogh, Secretary, Westland Road, Dublin.
" 22	Stratford, E.—Steam Roller Shed	—	Borough Engineer, Town Hall, West Ham, E.
" 22	Enniskillen—Repairs to Houses	Union Guardians	W. Frazer, Eden, Enniskillen.
" 22	Tendring, Essex—Alterations, &c., to Workhouse	St. John's Foundation School Committee	A. J. H. Ward, 42 Church Street, Harwich.
" 22	Leatherhead—Brick Wall	Urban District Council	Rev. A. F. Ruffy, St. John's Foundation School, Leatherhead.
" 22	Wimbledon—Library Extensions	—	R. J. Thomson, 47 Hill Road, Wimbledon.
" 23	Chellow Dean, Bradford—Pair of Semi-Detached Villas	Union Guardians	Fairbank & Wall, Architects, Craven Bank Chambers, Bradford.
" 23	Walthamstow—Hospital Buildings	County Council	Pennington & Son, Hastings House, Norfolk Street, Strand, W.O.
" 23	Glenamaddy, Ireland—Alterations, to Workhouse	—	J. R. D'Arcy, Clerk, Glenamaddy.
" 23	Kilkeany—Repairs to Court House	—	G. J. Morris, Secretary, Kilkenny.
" 23	Canton, Cardiff—Enlarging Church	—	J. W. Rodger, 14 High Street, Cardiff.
" 23	Wednesfield—Rebuilding Church	—	F. T. Beck, Wulfrun Chambers, Darlington Street, Wolverhampton.
" 24	Arclid, Cheshire—Steam Road Roller Shed	Congleton Rural District Council	A. Price, Architect, Elworth.
" 24	Belfast—Business Premises	J. Kiddell & Son	S. P. Close, Architect, Donegal Square Buildings, Belfast.
" 25	Boston, Lancs—Foundations for Municipal Buildings	Town Council	J. Rowell, Architect, Borough Office, Market Place, Boston.
" 25	Londonderry—Residence	East Sussex County Council	J. P. McGrath, 28 Carlisle Road, Londonderry.
" 25	Uckfield, Sussex—Police Buildings	—	F. J. Wood, County Surveyor, County Hall, Lewes.
" 28	Lumphinnans, Scotland—Public-House, &c.	Mynyddolwyn School Board	W. Birrell, 209 High Street, Kirkcaldy.
" 28	Fleur-de-Lis, Mon—School	Isolation Hospital Committee	R. L. Roberts, The Firs, Abercarn, Mon.
" 29	Meltham, near Huddersfield—Hospital Buildings	—	J. Berry, 3 Market Place, Huddersfield.
ENGINEERING:			
April 17	London, S.W.—Electric Wiring and Fittings	London County Council	Chief Engineer's Department, County Hall, Spring Gardens, S.W.
" 17	Manchester—Exhaust Pipes, Switchboards, &c.	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
" 18	Ashford, Middlesex—Engine	Managers of West London School District	F. G. Beeching, Clerk to Managers, Ashford, Middlesex.
" 18	Arrossan, Scotland—Waterworks	Town Council	W. R. Copland, 146 West Regent Street, Glasgow.
" 18	Glasgow—Air Heater	Corporation	P. Fyfe, 23 Montrose Street, Glasgow.
" 19	Ayr—Quay Wall	Harbour Trustees	T. Meik & Sons, 29 St. Andrew Square, Edinburgh.
" 19	Lurgan, Ireland—Pumps	Urban District Council	F. W. Pollock, Town Clerk, Town Hall, Lurgan.
" 19	Seacombe, Cheshire—Repairs to Landing Stage	Wallasey Urban District Council	Wood & Fowler, 3 Cook Street, Liverpool.
" 19	Manchester—Pumping Engines	Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester.
" 21	Albama, Spain—Steel Pier	Alqui Mines and Railway Co., Ltd.	Formans & McCall, 160 Hope Street, Glasgow.
" 21	Ash, near Sandwich—Alterations to Swge. Displ. Wks	Eastrey Rural District Council	F. H. Anson, 15 Dean's Yard, Westminster.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
April 21	Basingstoke—Well, &c.	Town Council	G. Fitton, Waterworks Manager, Town Hall, Basingstoke.
" 21	Glasgow—Electric Cables	Corporation	W. A. Chamen, 75 Waterloo Street, Glasgow.
" 21	Fenton, Staffs.—Foundation of Gasholder	Gas Committee	R. Surtees, Engineer, Gasworks, Fenton.
" 21	Southampton—Lathes, &c.	Corporation	W. J. Bosley, Superintendent, Corporation Wharf, Chapel, Sthmptn.
" 21	Stockport—Eight Steam Gauges	Corporation	J. Mansergh, 5 Victoria Street, S.W.
" 21	London, N.—Electric Lighting Requisites	Hornsey Urban District Council	E. J. Lovegrove, Council's Office, Southwood Lane, Highgate.
" 22	Christiania—Hand Pumps	Norwegian State Railways	Machinery Director, Christiania.
" 22	Burton-on-Trent—Tramways	Corporation	Borough Engineer, Town Hall, Burton-on-Trent.
" 22	London—Reconstructing Bridge over Regent's Canal	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 22	London, S.W.—Electrical Cables	London County Council	County Hall, Spring Gardens, S.W.
" 22	London, N.—Refuse-Destructor Plant	Tottenham Urban District Council	W. H. Prescott, 712 High Road, Tottenham, N.
" 22	London, E.C.—Engines, &c.	Bombay, Baroda & Central India Rly. Co.	T. W. Wood, Gloucester House, Bishopsgate Street Without, E.C.
" 22	Rotherhithe—Camp Sheeting & Timber Grid at Wharf	London County Council	Chief Engineer's Department, County Hall, Spring Gardens, S.W.
" 23	London, W.—Switchboards	Central Electric Supply Co., Ltd.	General Manager, 19 Carnaby Street, Golden Square, W.
" 23	Rotherham—Tramways	Corporation	H. H. Copnall, Town Clerk, Rotherham.
" 23	Stockport—Engine and Dynamo	Gas and Electricity Committee	Engineer, Town Hall, Stockport.
" 23	Swindon—Electric Cables, &c.	Corporation	Lacey, Oliphugh & Sillar, 78 King Street, Manchester.
" 23	Hamilton, Scotland—Waterworks	Waterworks Commissioners	W. R. Copland, 146 West Regent Street, Glasgow.
" 24	Mildenhall, Suffolk—Gas Fittings and Gasmeters	Guardians	F. E. Bloss, Clerk, Mill Street, Mildenhall, Suffolk.
" 24	Mildenhall, Suffolk—Two Mains	Gas Co., Ltd.	O. F. Read, Clerk, Mildenhall.
" 24	Dundee—Engine and Dynamo	Gas Commissioners	W. H. Tittensor, City Electrl. Engr., Dabhops Crescent Rd., Dundee.
" 24	Rathmines, Ireland—Engine-House Plant, &c.	District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 25	West Hartlepool—Sewerage Works	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
" 26	Hull—Pumping Machinery	Corporation	F. J. Bancroft, City Engineer, Alfred Gelder Street, Hull.
" 28	George Town, Penang—Electrical Plant	Municipal Commissioners	Prece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 28	Bexley Heath, Kent—Tramway Requisites	Electric Lighting & Traction Committee	Morley & Dawbarn, 82 Victoria Street, Westminster, S.W.
IRON AND STEEL:			
April 17	Leeds—Pipes	Corporation	City Engineer, Leeds.
" 18	London, S.E.—Railway Stores	South-Eastern & Chatham Rly. Companies	Superintendent of Stores, 84 Tooley Street, S.E.
" 19	Old Trafford Manchester—Steelwork for Public Baths	Stretdford Urban District Council	E. Woodhouse, Architect, 88 Mosley Street, Manchester.
" 21	London, N.—Electric Stores, &c.	Hornsey Urban District Council	E. J. Lovegrove, Council Offices, Southwood Lane, Highgate, N.
" 21	Glasgow—Iron and Steel Castings, Ironmongery, &c.	Corporation	J. Young, 88 Renfield Street, Glasgow.
" 21	London, N.—Metal Plates, &c.	Islington Borough Council	G. P. Barber, Borough Engineer, Town Hall, Upper St., Islington.
" 22	London, E.C.—Rails, &c.	Southern Mahattra Rly. Co., Ltd.	Secretary, 46 Queen Anne's Gate, Westminster.
" 22	Dublin, Railway Stores	Dublin, Wicklow & Wexford Rly. Co.	M. F. Keogh, Secretary, Westland Row, Dublin.
" 22	Leeds—Cast-iron Pipes, &c.	Gas Department	Stores Department, 21 Dewsbury Road, Leeds.
" 22	West Ham, E.—Wrought-iron Railing	Corporation	Borough Engineer, Town Hall, West Ham, E.
" 23	Calcutta—Stopcocks	Corporation	F. Gainsford, Secretary, Corporation Office, Calcutta.
" 24	Plymouth—Cast-iron Pipes	Water Committee	F. Howarth, Water Engineer, Municipal Buildings, Plymouth.
PAINTING AND PLUMBING:			
April 17	Dewsbury—Cleaning and Painting Offices	Guardians	J. Peace, Clerk, Union Offices, Wellington Street, Dewsbury.
" 18	London, S.E.—Paints, &c.	South-Eastern & Chatham Rly. Companies	Superintendent of Stores, 84 Tooley Street, S.E.
" 21	Nottingham—Painting	Guardians	G. M. Howard, Poor-Law Offices, Shakespeare St., Nottingham.
" 21	Glasgow—Brushes, Plumber's Material, Oil, Paints, &c.	Corporation	J. Young, 88 Renfield Street, Glasgow.
" 22	Dublin—Varnishes, Paints, Oils, &c.	Dublin, Wicklow & Wexford Rly. Co.	M. F. Keogh, Secretary, Westland Row, Dublin.
" 23	Plumstead—Painting, &c., at Infirmary	Woolwich Union Guardians	T. O. Cock, 1A Eleanor Road, Woolwich.
" 25	Pontefract—Painting and Decorating Chapel		Tennant & Bagley, Architects, Pontefract.
ROADS AND CARTAGE:			
April 17	London, N.E.—Making-up, &c., Road	Hackney Borough Council	N. Scorgie, Borough Engineer, Town Hall, Hackney, N.E.
" 18	Cromer—Road-making	Urban District Council	A. F. Scott, Council's Surveyor, Church Street, Cromer.
" 18	Cwmaman, Wales—Roads, &c.		J. L. Smith & Davies, Architects, Aberdare.
" 18	Frinton-on-Sea, Essex—Making-up Roads	Urban District Council	T. W. Golds, Surveyor, Thorpe-le-Soken, Essex.
" 18	Hull—Street Works	Corporation	City Engineer, Hull.
" 19	Worsborough, near Barnsley—Cinders and Granite	Rural District Council	J. Whitaker, Surv., Saville Ho., Worsborough Bridge, nr. Barnsley.
" 19	Harrow—Street Works	Urban District Council	J. P. Bennetts, Surveyor, Council Offices, Harrow.
" 19	Maidstone—Materials, &c.	Urban District Council	F. Bunting, Borough Surveyor, Fair Meadow, Maidstone.
" 19	Southborough, Kent—Stone and Quartzite	Urban District Council	P. Hamner, Clerk, Council Office, Southborough.
" 21	Kent—Maintenance and Repair of Roads	County Council	F. W. Ruck, 88 Week Street, Maidstone.
" 21	Stevenage, Herts—Granite	Urban District Council	W. O. Times, Clerk, Council Offices, Stevenage.
" 21	Guildford—Road Works	Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford.
" 21	Ince, Lancs—Setts	Urban District Council	A. T. Swain, Surveyor, Council Offices, Ince Green Lane, Ince.
" 22	Bromley, Kent—Road Materials	Urban District Council	F. H. Norman, Clerk, Council Offices, Bromley, Kent.
" 22	Bromley, Kent—Street Improvement Works	Urban District Council	F. H. Norman, Clerk, Council Offices, Bromley, Kent.
" 22	Tottenham—Making-up Roads	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
" 22	Winchester—Road-making, &c.	Town Council	City Surveyor, Winchester.
" 24	Houghton-le-Spring, Durham—Materials	Rural District Council	D. Balfour, Surveyor, Houghton-le-Spring.
" 24	Rugby—Roads, &c.	Benefit Building Society	J. T. Franklin, Architect, Regent Street, Rugby.
" 26	Newmarket—Granite Metalling	Urban District Council	S. J. Ennion, Clerk, Deva Chambers, Newmarket.
" 30	Harrogate—Asphalting	St. Mary's Burial Board	H. Horner, 9 Royal Parade, Harrogate.
SANITARY:			
April 19	Marple, near Stockport—Sewers, &c.	Urban District Council	H. Bancroft & Son, 88 Mosley Street, Manchester.
" 21	Ash, nr. Sandwich—Alterations, Sewage Disposal Wks.	Eastrey Rural District Council	F. H. Anson, 15 Dean's Yard, Westminster.
" 21	Obaderton, Lancs—Sewers, &c.	Urban District Council	J. Diggle, Civil Engineer, Hind Hill Street, Heywood, Lancs.
" 22	Biggleswade, Beds—Sewerage Works	Rural District Council	Surveyor, Council Office, Biggleswade.
" 23	Kingsbury, Middlesex—Sewerage Works	Kingsbury Urban District Council	W. T. Mansfield, Clerk, Council's Offices, Kingsbury Road, N.W.
" 28	Fennam, Northumberland—Sewers	Urban District Council	H. W. Taylor, Engineer, St. Nicholas Chambers, Newcastle.
" 28	Sittingbourne—Sewerage Works	Urban District Council	J. C. Melliss, 264 Gresham House, Old Broad Street, E.C.
" 29	Hayfield—Sewers, &c.	Rural District Council	H. Bancroft & Son, 83 Mosley Street, Manchester.
" 29	Maidling, Kent—Sewerage Works	Rural District Council	H. Robinson, Parliament Mansions, Victoria Street, Westminster.
TIMBER:			
April 18	London, S.E.—Woodwork, &c.	South Eastern & Chatham Rly. Cos.	Superintendent of Stores, 84 Tooley Street, S.E.
" 22	Dublin—Timber	Dublin, Wicklow & Wexford Rly. Co.	M. F. Keogh, Secretary, Westland Row, Dublin.
" 24	Southampton—Timber	Director-General, Ordnance Survey	Officer in Charge of Stores, Ordnance Survey Office, Southampton.
" 28	York—Sleepers Blocks and Crossing Sleepers, &c.	North-Eastern Railway Co.	Secretary, York.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 21	Coleraine—Twenty-five Workmen's Dwellings	£20, £10.	W. Henry, Clerk to Urban District Council, Town Hall, Coleraine.
" 30	Glasgow—Branch Library (Local Architects)	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 1	York—Queen Victoria Memorial	£50.	W. H. Andrew, Town Clerk, Guildhall, York.
" 1	Mexborough, near Rotherham—Accident Hospital	£35, £10.	C. Brampton, Fern Villa, Mexborough.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 1	Klarsborough—Infectious Disease Hospital	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
Sept 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

Builders' Notes.

Mr. Frederick Adkins, senior partner in the firm of Messrs. Adkins Brothers, builders, of Victoria Road, Surbiton, died recently.

Messrs. G. B. Kent & Sons, Ltd., of 75, Farringdon Road, E.C., have just issued a new sundry catalogue of thirty-two pages.

The New Stour Valley Brickworks of Messrs. S. Barnett & Sons, Tipton, were formally opened last week. They are situated at Dudley Port. The new plant is capable of turning out 50,000 bricks per day. Mr. James Shenton, M.I.C.E., was the engineer of the works.

A Gladstone Statue.—Shoremaster Boddie, Aberdeen, has received the order for the massive granite pedestal for the statue of the late Mr. Gladstone, by the sculptor, Mr. W. Hamo Thornycroft, R.A., which is to be erected in George Square, Glasgow. The pedestal is to be of fine axed white Kemnay granite, and will weigh about 44 tons.

The Granite used in London Bridge.—The exterior of London Bridge is constructed of three sorts of granite. The eastern side is of the purplish Aberdeen granite; the western side, of the light-grey Haytor granite from the Haytor quarries, which lie adjacent to the famous Hay Tor rock, near Bovey Tracey; and the voussoirs on both sides are of both sorts and an admixture of the red-brown granite of Peterhead. The fillings-in are of Bramley Fall, Derby and Whitby stone.

Brick- and Tile-Making in Rhodesia.—Messrs. Taylor, Jarvis & Short, of Salisbury, Rhodesia, have now started brick- and tile-making, and recently took delivery of about 55 tons of brick- and tile-making machinery supplied about three years ago by Messrs. Robey & Co., Ltd., and Messrs. J. Whitehead & Co., Ltd., which had lain for 2½ years at Beira. As testimony to the expert packing which English firms of repute adopt, despite its long sojourn on the coast the plant was found to be in as good condition as when it left the makers' workshops. There is a large demand for good bricks in South Africa, and this is particularly the case at Bulawayo and in adjacent districts. The new engine equipment of the Bulawayo Electric Lighting Works was also supplied by Messrs. Robey & Co., Ltd.

British Fire Prevention Committee.—The Executive announces that Mr. Ellis Marsland, district surveyor of Camberwell, has consented to act as hon. secretary, thus supporting Mr. Edwin O. Sachs, the chairman, particularly in respect to the testing work, which has grown far beyond what was originally anticipated. Mr. Marsland, who has been closely associated with the committee from its outset, is this year Master of the Worshipful Company of Tilers and Bricklayers. The working Executive has also been strengthened by the following additional members:—Mr. J. W. Sheppard, North British and Mercantile Insurance Company; Mr. Langridge, A.M.I.E.E., Royal Insurance Company; and Mr. Hamilton, A.R.I.B.A., district surveyor for North Fulham. As to the testing arrangements of the committee for the coming session, tests are being arranged with another heavy warehouse floor, with roofing by the Vulcanite Co., Ltd., with glass by the Union Plate Glass Co., Ltd., who wish to have their wired glass compared with the glazing of the Luxfer Prism Co., and Messrs. Pilkington, whose materials have already been under investigation.

New Companies.

Manchester Geographical Society Building Co., Ltd.

Registered to adopt a certain agreement, to acquire land near Manchester, and to erect any buildings thereon; other objects as indicated by the title. Capital £10,000 in £10 shares. The first directors are E. W. Greg, H. Nuttall, E. W. Mellor, A. A. G. Tulloch, G. Oppenheim and E. Sowerbutts.

Industrial Electric Co., Ltd.

Registered to acquire the business of Siegbert Raphael and Joseph Gray, trading as the Industrial Electric Co. at Egremont, Cheshire, and to carry on business as manufacturers of and dealers in electric bells, insulators, switches, lamps, motors, fittings, and as mechanical and electrical engineers, &c. Capital £2,000 in £1 shares. The directors are S. Raphael and J. Gray.

Bradford Central Estates Co., Ltd.

Registered to acquire lands, buildings and hereditaments in Yorkshire or elsewhere; to acquire certain pieces or parcels of ground and buildings at Bradford, and to carry on the business of land and property owners, builders, contractors, estate agents, decorators, merchants, financiers, &c. Capital £40,000 in £10 shares. The first directors are J. T. Riddlough, M. O'Flynn, W. Wray, T. T. Empsall, J. A. J. Clarkson, G. E. Verity and W. A. Thornton. Registered office: 7, Exchange, Bradford, Yorkshire.

Heenan & Frowde, Ltd.

Registered to acquire the business of engineers, bridge builders and contractors, carried on by H. Heenan, at Newton Heath Ironworks, Manchester, at Aston Works, Birmingham, and

at 4, Chapel Walks, Manchester, as Heenan & Frowde, and to carry on the business of bridge builders, engineers, contractors, manufacturers of agricultural implements, tool makers, brass founders, metal workers, &c. Capital £200,000 in £10 shares (10,000 5 per cent. cumulative preference). The first directors are H. Heenan, J. Munro and C. J. Seaman.

Permanent Enamel Co., Ltd.

Registered to acquire the business of enamelled iron manufacturers as carried on at Pelly Road, Plaistow, Essex, as the Permanent Enamel Co., and at 75, Farringdon Street, as H. Phillips; and as enamelled iron merchants and manufacturers, ironfounders, mechanical engineers, metal workers, &c. Capital £2,500 in £1 shares.

Leicester Brick Co., Ltd.

Registered to carry on the businesses of brick merchants and manufacturers, makers of tiles, pipes, pottery and other things composed or usually made of clay, fire-clay, terra-cotta, &c. Capital £10,000 in £1 shares. The first chairman is Orson Wright, of South Wigton, Leicester.

Lowther, Halliday & Forrest, Ltd.

Registered to acquire the leases of the quarry at Knowehead, Lochaber, Dumfriesshire, and to carry on the business of quarry masters and quarriers. Capital £16,000 in £10 shares (800 preference). Registered office: 93, Irish Street, Dumfries.

Emdeca Metal Decoration Co., Ltd.

Registered to acquire the business of the Emdeca Metal Decoration Co., and to carry on the business of supplying, fixing and dealing in enamelled metal wall and ceiling decorations and metal ceilings and partitions; also as builders and contractors, house decorators, &c. Capital £5,000 in £1 shares. The directors are M. Heymann and E. Heine. Registered office: 97, Queen Victoria Street, E.C.

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CURRENT MARKET PRICES.

FORAGE.			
	£ s. d.	£ s. d.	
Beans per qr.	1 10 0	—	
Clover, best per load	4 15 0	5 10 0	
Hay, best do.	5 5 0	5 12 6	
Sainfoin mixture do.	4 10 0	5 5 0	
Straw do.	1 8 0	2 0 0	
OILS AND PAINTS.			
Castor Oil, French .. per cwt.	1 7 0	1 8 7	
Colza Oil, English .. do.	1 6 9	—	
Copperas per ton	2 0 0	—	
Lard Oil per cwt.	2 9 6	—	
Lead, white, ground, carbonate do.	1 4 10	—	
Do. red do.	1 0 4 1/2	—	
Linseed Oil, barrels .. do.	1 10 3	—	
Petroleum, American .. per gal.	0 0 6 1/2	—	
Do. Russian do.	0 0 5 1/2	0 0 6 1/2	
Pitch per barrel	0 7 0	—	
Shellac, orange per cwt.	5 17 0	5 18 0	
Soda, crystals per ton	3 2 6	3 5 0	
Tallow, Home Melt .. per cwt.	1 10 0	1 11 0	
Tar, Stockholm per barrel	1 2 6	—	
Turpentine per cwt.	1 11 7 1/2	1 11 9	
METALS.			
Copper, sheet, strong .. per ton	71 0 0	—	
Iron, Staffs, bar do.	6 0 0	8 10 0	
Do Galvanised Corrugated sheet .. do.	11 12 6	12 0 0	
Lead, pig, Soft Foreign .. do.	11 11 3	11 12 6	
Do. do. English common brands do.	11 16 3	—	
Do. sheet, English 31b per sq. ft. and upwards .. do.	13 0 0	—	
Do. pipe do.	13 10 0	—	
Nails, cut clasp, 3in. to 6in. .. do.	9 0 0	—	
Do. floor brads do.	8 15 0	—	

STEEL, STAFFS, GIRDERS AND ANGLES.			
	£ s. d.	£ s. d.	
Do. do. Mild bars do.	5 15 0	6 5 0	
Tin, Foreign do.	6 10 0	7 0 0	
Do. English ingots do.	125 7 6	125 17 6	
Zinc, sheets, Silesian .. do.	127 0 0	127 10 0	
Do. do. Vieille Montaigne .. do.	21 0 0	—	
Do. Spelter do.	21 10 0	—	
Do. Spelter do.	17 15 0	18 0 0	
TIMBER.			
SOFT WOODS.			
Fir, Dantzic and Memel .. per load	2 1 0	—	
Pine, Quebec, Yellow .. per load	4 7 6	6 0 0	
Do. Pitch do.	2 11 0	3 11 0	
Laths, log, Dantzic .. per fath.	4 10 0	5 10 10	
Do. Petersburg per bundle	0 8	—	
Deals, Archangel 2nd & 1st per P. Std.	15 5 0	22 0 0	
Do. do. 4th & 3rd do.	10 15 0	12 10 0	
Do. do. unsorted do.	5 12 6	6 10 0	
Do. Riga do.	6 15 0	8 10 0	
Do. Petersburg 1st Yellow .. do.	13 15 0	—	
Do. do. 2nd do.	10 0 0	13 15 0	
Do. do. White do.	7 5 0	11 10 0	
Do. Swedish do.	9 15 0	16 0 0	
Do. White Sea do.	10 10 0	11 15 0	
Do. Quebec Pine, 1st do.	19 10 0	21 5 0	
Do. do. 2nd do.	12 0 0	17 10 0	
Do. do. 3rd & c. do.	12 0 0	—	
Do. Canadian Spruce, 1st .. do.	7 10 0	9 5 0	
Do. do. 3rd & 2nd do.	7 5 0	9 15 0	
Do. New Brunswick do.	7 5 0	8 0 0	
Battens, all kinds do.	7 0 0	10 5 0	
FLOORING BOARDS LIN.			
Do. prepared, 1st per square	0 11 0	—	
Do. 2nd do.	0 10 3	—	
Do. 3rd & c. do.	0 8 9	0 10 0	
HARD WOODS.			
Ash, Quebec per load	3 17 6	4 10 0	
Birch, Quebec do.	3 12 6	3 17 6	
Box, Turkey per ton	7 0 0	15 0 0	

COMING EVENTS.

Wednesday, April 16.
 BRITISH ARCHEOLOGICAL ASSOCIATION.—Mr. Andrew Oliver on "Some Old London Views." Rev. J. A. Penny, M.A., on "Curiosities I have seen in and about Churches." 8 p.m.
 GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.
 SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. W. Hunting on "Practical Methods of Stalling and Slaughtering Animals," 7 p.m. Inspection and Demonstration at Knacker Yard.
 SOCIETY OF ARTS.—Mr. J. Bridges-Lee, M.A., on "Photography as applied to Architectural Measurement and Surveying," 8 p.m.
 BUILDERS' FOREMAN AND CLERKS OF WORKS INSTITUTION.—Members' Meeting at 8 p.m.
 Thursday, April 17.
 SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.
 INSTITUTION OF ELECTRICAL ENGINEERS (Dublin Section).—Mr. A. T. Kinsey on "Railway Blocks, Telegraphs and Accessories: Recent Practices," 8 p.m.
 INSTITUTION OF MECHANICAL ENGINEERS.—Annual Dinner at the Hotel Cecil.
 ROYAL INSTITUTION.—Prof. Dewar on "The Oxygen Group of Elements"—II., 3 p.m.
 SOCIETY OF ARTS (Indian Section).—Mr. Sidney Preston, A.M.I.C.E., on "Recent Developments in Punjab Irrigation," 4.30 p.m.
 Friday, April 18.
 ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. A. Needham Wilson on "A Tour in the South of France," 7.30 p.m.
 INSTITUTION OF MECHANICAL ENGINEERS.—Meeting, at 8 p.m.

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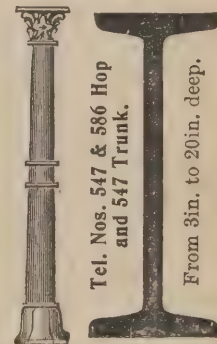
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COMING EVENTS—cont.

VIKING CLUB, Thomas Street, Grosvenor Square, W.—Mr. A. W. Johnston, F.S.A. Scot., on "The Earl's House and Round Church of Orphir, Orkney," 8.30 p.m.
INSTITUTION OF MECHANICAL ENGINEERS.—Mr. Robert E. Atkinson on "The Standardization of Pipe Flanges and Flange Fittings," 8 p.m.
EPIDEMIOLOGICAL SOCIETY.—Dr. Thresh on "Smallpox Hospitals and the Spread of Infection," 8.30 p.m.
INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. H. C. M. Austen on "The Erewash Valley Widening and Toton Sidings," 8 p.m.
ROYAL INSTITUTION.—Sir John H. A. Macdonald on "The Auto-Car," 9 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. James King on "Diseased Meat," 7 p.m.

Saturday, April 19.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Visit to the Prudential Buildings in High Holborn, E.C., at 3 p.m.
SANITARY INSTITUTE.—Inspection and Demonstration for Sanitary Officers at Morden Hall Dairy Farm, Morden, Surrey, at 8 p.m., conducted by Mr. Oscar J. White.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Traquair House and the Town of Innerleithen.
LIVERPOOL ARCHITECTURAL SOCIETY.—Excursion to the New Gladstone Memorial Library at Hawarden, and the Church and Castle, 8 p.m.

Monday, April 21.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. Alexander N. Paterson, M.A., on "Tradition in Architecture: Its Function and Value," 8 p.m.
LIVERPOOL ARCHITECTURAL SOCIETY.—Annual General Meeting.
VICTORIA INSTITUTE.—Mr. J. Stefansson, Ph.D., on "Iceland: Its History and Inhabitants," 4.30 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, M.D., on "Fresh Meat," 7 p.m.

Tuesday, April 22.

SANITARY INSTITUTE (Inspection and Demonstrations for Sanitary Officers at the Metropolitan Cattle Market, York Road, N., at 3 p.m., conducted by Mr. James King.

Wednesday, April 23.

INSTITUTION OF CIVIL ENGINEERS (Special Meeting: Tenth "James Forrest" Lecture).—Sir William Chendler Roberts-Austen on "Metallurgy in relation to Engineering," 8 p.m.
SOCIETY OF ARTS.—Professor Silvanus P. Thompson, D.Sc., F.R.S., on "Opto-Technics," 8 p.m.
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, M.D., on "The Hygiene of Byres, Lairs, Cow Sheds, and Slaughter-Houses," 7 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Business Meeting, and President's Valedictory Address by Mr. Henry F. Kerr, A.R.I.B.A.
SOCIETY OF ANTIQUARIES OF LONDON.—Anniversary Meeting at 2 p.m.
Thursday, April 24.
SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Charles E. Keyser, F.S.A., on "Some Ancient Wall Paintings."

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

COMBIMARTIN (N. DEVON).—Accepted for the erection of a house at Combimartin, N. Devon, for Mrs. Wm. Chialacombe. Mr. Allen T. Russell, A.R.I.B.A., architect, Ilfracombe.—
W. C. Latham, Combimartin (masonry and plumber) £130 15 0
R. Goss & Sons, Combimartin (remaining trades) 124 8 6
BIRMINGHAM.—For the erection of premises, with asphalted roof, Montgomery Street, Birmingham, for Fairbanks, Ltd. Mr. Chas. Hook Collett, architect. Quantities by Mr. Hy. Glover.—
Gill £3,700 (Crawley) 2,870
Rowlitham 3,335 Elvin 2,830
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W. Fincham 1,425
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J. Smith & Son 1,553 H. Potter 1,875
W. Fincham 1,550 [Rest of Chelmsford.]

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T. Free & Sons, Maidenhead 1,330 0 0
W. H. Wheeler, 235 Blackfriars Road, S.E. ... 1,193 0 0
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* Provisionally accepted.

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M. Henderson 13,020 4 0
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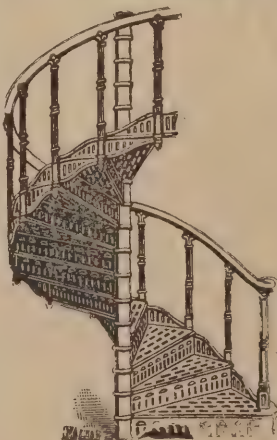
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[Engineer's estimate, £2,802.]
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G. Roberts & Bros., Rhydolun Works, Llandulno ... 5,600
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J. S. Dawson, Blackpool 5,978 5 1
Hughes & Rowland, Colwyn Bay 5,580 0 0
W. Coker, Rochester 5,307 15 0
J. Taylor, Garston 5,250 0 0
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* Accepted.

OSWESTRY.—For construction of a swimming bath, the erection of a boiler house, chimney shaft, laundry, and other buildings in connection therewith at the gymnasium in Victoria Street, for the Town Council. Mr. G. William Lucy, C.E., borough engineer and surveyor:—
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H. Price, Welsh Bridge, Shrewsbury 1,520 0 0
W. H. Thomas, Oswestry 1,487 11 8
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* Accepted. [Borough engineer's estimate, £1,500.]

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W. Hillman, Portslade-by-Sea 4,671 9 0
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An Architectural Causerie.

Mr. Bodley and Mr. Shaw. IT has now been officially announced that Mr. G. F. Bodley, R.A., and Mr. R. Norman Shaw, R.A., have accepted the invitation of the Liverpool Cathedral Committee to act as their architectural advisers in the preliminary selection of architects and in the ultimate selection of a design for the Liverpool Cathedral. This will undoubtedly meet with approval in all quarters. A better choice could not have been made. It satisfies both parties, for while Mr. Bodley, as an earnest advocate of Gothic and the designer of many beautiful churches, will satisfy those who flock to Mr. Robert Gladstone's banner, the other party will rest assured that the influence of Mr. Norman Shaw, as the leading architect in this country, will counteract any undue preponderance for the one particular style. It is interesting to note the views which these two men hold in regard to the matter. Mr. Bodley believes Gothic, at its best, to be the most beautiful and most poetical architecture that the world has ever seen. He says: "If I compare the interior of Westminster with St. Paul's, my greater praise and deliberate choice is for the supreme beauty of the Abbey. . . . Nor does Westminster stand alone for the expression of refined grandeur." In saying this Mr. Bodley endorses the opinion of Coleridge, who wrote: "When I enter a great classical church such as St. Peter's at Rome, or St. Paul's, London, I feel how great is Man; but when I enter Westminster Abbey or other great Gothic churches I feel how small is Man." Mr. Norman Shaw, on the other hand, considered that the restriction of the style of Liverpool Cathedral to Gothic was "simply deplorable," and, moreover, he strongly objected to any form of competition being held, favouring instead the selection of an architect of proved ability (proved by actual work executed), to whom a perfectly free hand should be given: and in support of his contention he cited the late Mr. Bentley and his magnificent design at Westminster—"It is like a revelation after the feeble Gothic stuff on which we have been mainly fed for the last half-century." Bentley was a devoted "Gothic man" for about forty years, but, says Mr. Shaw, "when he was confronted with this great work he threw off his Gothic shackles, and made an entirely new capture, feeling, I have little doubt, that he could do better in another manner." It is thus pretty evident how divergent are the two men's views; yet it were well; and if only the Committee will behave themselves and not treat Mr. Bodley and Mr. Shaw as puppets we shall doubtless obtain the best selection that can be made from the designs which are to be submitted

by the end of next month.—Whilst referring to Mr. Bodley, it is perhaps opportune to note that a dinner was recently given to him by his past and present pupils and assistants to celebrate the somewhat tardy honour awarded him by the Royal Academy. Professor F. M. Simpson, one of the earliest pupils, occupied the chair. In the course of the evening a large silver salver was presented to Mr. Bodley as a memorial of the occasion. The salver, which has been admirably made by Messrs. Widdowson & Veale bears on the face Mr. Bodley's coat-of-arms, and on the back the following inscription written by the President of Magdalen College, Oxford:—

GEORGIO . FREDERICO . BODLEY
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VIRO . OMNIBUS . MUSIS . AMICO.
SUMMO . ARCHITECTO.

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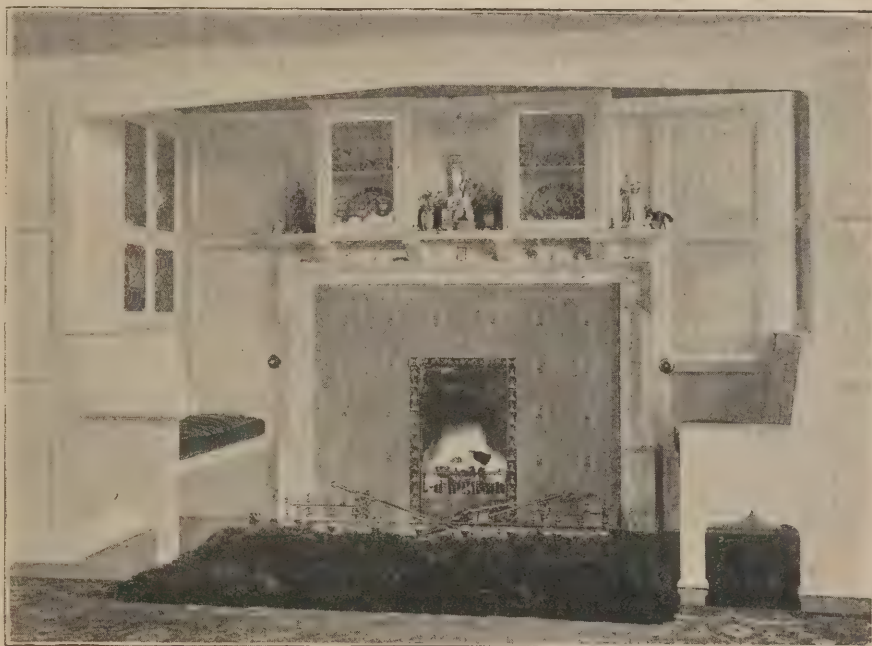
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O. Dudley.

conscience; a kind of courtesy to architectural demands; and that at heart the Council either did not believe in, or have sufficient taste to care for, a uniform treatment.

Truro Cathedral. THE report of Sir Thomas Drew on the fractured bases of the piers in Truro Cathedral has now been published in full. A summary will be found on p. 151. Sir Thomas ascribes the cause to the mortar being so finely ground and scientifically mixed that the piers became practically monoliths, "with the attendant risk of undistributed pressure all coming on a single bed, and that under the plinth. . . . The modern mortar was too prompt in its setting quality and too thin to allow of the automatic adjustment that is afforded by a thick swimming bed of old mortar." He also thinks the weights were too soon imposed on the substructure. The wrought stones were bedded out to the face and the joints pointed-up as the work rose. This is a practical method with suitable mortar rightly handled; but tight bedding was adopted at Truro. The occurrence draws attention once more to the general misunderstanding of the function of bedding. Sir Thomas considers the bases should be restored, and states he would not take the responsibility of advising inaction; yet, in spite of this warning, the Committee have decided not to remedy the damage, presumably on the recommendation of the architect, Mr. F. L. Pearson, and the



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DRAWING-ROOM. ALBERT E. DIXON, A.R.I.B.A., ARCHITECT.

The Council's Competition.

QUITE recently the London County Council put up a large black board at the corner of Wych Street showing a plan of the crescent end of the new street to Holborn and announcing that three extensive building plots at the eastern end of the island portion would be offered at Tokenhouse Yard on June 17th. Opposite, on the corner of the crescent, Carr's new restaurant and offices is to be built according to Mr. Walter Emden's designs, while at the other end of the island the new Gaiety Theatre and Restaurant, and Short's new premises, are being rapidly erected from Mr. Runtz's designs (largely altered by Mr. Norman Shaw). In October, 1900, there was a brave show of the schemes formulated by the eight architects whom the Council selected, and to whom they paid £2,000 for their trouble. And these two facts do not tally. Everything goes to indicate that the Council have abandoned the idea of a homogeneous treatment of these blocks of buildings, though the opportunity was the finest ever given them. If this proves to be true, the spending of £2,000 on a competition was a pure waste, and would only confirm the belief in many minds that this was simply a weak concession to their municipal

contractor, Mr. Willock, who were present at the meeting. This is a grave mistake.

The Persistent Problem.

PEOPLE are always disputing about "restoration," and doubtless Mr. Caröe's method before the Architectural Association will not be accepted in all quarters. Mr. Caröe was particularly insistent on the modern architect "effacing" himself when called upon to make additions to any old building, but personally we cannot altogether agree with this view. It is considered perfectly proper for Early English additions to be made to a Norman building or for a Perpendicular window to be inserted in a Decorated church, yet nowadays we are told to abhor such ways, and to swallow up our own work in what can never be more than a mimicry of the old. With Mr. Selwyn Image, we consider that when a new window has to be inserted in an ancient church it shall be the best that the artist is able to produce after his own device. It is true that individual instances may be cited where most unpleasant, even disastrous, results have followed by such a practice being adopted; but the principle itself is nevertheless much nearer the truth than the other.



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MODERN LIGHTHOUSE CONSTRUCTION.

By G. DRYSDALE SWEETMAN.

AT a recent meeting of the Institution of Junior Engineers Mr. G. Drysdale Sweetman, of Ryde, gave some "Notes on Modern Lighthouse Construction."

To illustrate the evolution of structural design the four erections on the Eddystone were briefly described, and their chief points of difference indicated as follows:—The base of Winstanley's tower (1695) was built of stone, strengthened with iron bands; its sides were vertical, and were encumbered with a profusion of unnecessary and even dangerously obstructive ornament. It was in the form of an octagon 100ft. high, and was destroyed by a storm in 1703. Rudyerd's tower (1705) was built of wood ballasted with stone. Its plan was circular and the unwieldy ornament was omitted. In section it was a frustrum of a cone, 23ft. in diameter at the base and 14ft. at the top, and about 67ft. high. The foundation rock was levelled off in steps and the tower united to it by means of bolts keyed into the rock. It was destroyed by fire in 1755. Smeaton's historic structure was finished in 1759. The material was stone, and for external form the trunk of an oak tree was chosen. The base was thus considerably broadened and the waist narrowed in comparison with Rudyerd's tower. The masonry was bonded together and into the rock by an elaborate system of dove-tailing. It was 76½ft. high, and was partially removed in 1882 owing to the concussive erosion of the bed-rock, which threatened its stability. Douglas's new Eddystone was built of granite and differed from the last-named in having a cylindrical base with vertical sides carried 2½ft. above high-water mark. The tower, which was a concave elliptic frustrum, started from the top of this vertical plinth. The total height from foundation to vane was 170ft. The walls were 8ft. 6in. thick at the base and 2ft. 3in. at the top. The tower was solid to a height of 25ft. 6in. above high water.

In some experiments on wave power made at the Skerryvore and at the Bell Rock by Thomas Stevenson forces as great as 6,083lbs. per ft. at the former and 3,013lbs. at the latter station had been recorded; with these stupendous forces to combat it behoved the designer to appreciate every minute detail of the disturbing elements and to endeavour to neutralise their action. By spreading out the base not only was a broader foundation area obtained and the centre of gravity lowered, but also the force centre of

each wave stroke was raised by the momentum of its impact and a portion of its violence dissipated in overcoming the force of gravity. There was a limit, however, to this base-spreading policy, set by the tendency of the wave crests and spray to rise so as to obscure the lantern, and it was partly to obviate this difficulty that the late Sir James Douglas designed the new Eddystone with a cylindrical base.

The generally accepted shape for a lighthouse in plan was circular, but the suggestion was offered that with a polygonal plan of many sides but little more obstruction would be made to the waves, and instead of swirling round as in the case of a circular tower the waves would be made to take a rather divergent course, and so offer a lee-side for landing purposes. The foundation courses should in all cases be sunk below the surface of the rock, for, though the stability of the structure depended for the most part on its weight and the low position of its centre of gravity, the idea was to make the tower virtually a projection of the rock itself. It was important that the pressure of all the materials and structural units within the tower acted vertically, so as not to produce a resolved force operating laterally as an outward thrust. Care should be taken to so locate the openings in the tower as to afford them the greatest protection. It was interesting to note that the presence of seaweed was of great advantage in breaking the force of waves. The internal accommodation usually comprised the service-room, which contained the lantern, attendants' room, bedroom, general stores, oil stores or (as the case may be) gas store, dynamo-room, &c. A water tank low down in the base and a crane were also necessary.

The author in referring to materials of construction pointed out that although skeleton towers were often easier to erect than masonry ones, owing to the difficulty of devising a safe landing-stage during rough weather, and also to the impossibility of fixing any floor below the highest probable wave crest, accommodation was greatly hampered if a very high tower were not otherwise necessary. For masonry structures, the granites, syenites and porphyries

were the most useful stones. In some situations the use of concrete has much to recommend it, and if only the difficulties of cracking could be obviated there was no doubt but that the material would be more largely used. Besides the popular theory of expansion and contraction, the possibility of some sudden chemical change in the later portions of the setting process producing a disruptive molecular disturbance, or perhaps of the mass being in itself in such a state of initial tension or compression that it was sensitive to ætherial or seismic tremors which would not affect a more resilient material, were advanced to account for the cracking of mass concrete.

In conclusion the author dealt with the optical arrangements of lighthouses.

CHESTER CATHEDRAL.

THE RESTORED SOUTH TRANSEPT.

THE Chester Archaeological Society recently inspected the restored south transept of Chester Cathedral, now almost completed. Before the visitors proceeded to examine the various parts a paper was read by Archdeacon Barber, in which, after the history of the transept had been related, he described in order the various stages of the restoration or reparation of this transept after £1,000 granted by the Ecclesiastical Commissioners had been expended in 1880 in the repairs of external work. The first thing undertaken was the groining of the eastern aisle. Having explained the representations on the various carved bosses, the Archdeacon passed on to the year 1887, when the mean tracery was removed from the great south window and replaced by that of the late Sir Arthur Blomfield. In 1889 the eastern aisle was refloored, the divisions between its several chapels indicated, and the sedilia and piscina in St. Nicholas' Chapel restored. Other windows designed by Mr. Kempe were added as memorials. Coming to the restoration now approaching completion, Archdeacon Barber, after explaining its inception as a memorial to the late Duke of Westminster, said the columns and walls had been cleared of numerous coats of whitewash, thus disclosing the original stone. Extensive repair was necessary not only at the bases, but also in other portions of the piers. The vaulting of the roofs had been carried out for the first time. All the bosses were designed by Mr. Blomfield in conjunction with Messrs. Thompson, whose carvers executed them under the guidance of Mr. Fincher, who carved the bulk of the figures himself. Some idea might be formed of the extent of the work from the fact that the stones out of which the larger bosses were carved weighed three-quarters of



a ton. Turning to the central portion the Archdeacon said they could not but admire the general effect of the groining, and again commend the wisdom of Sir Gilbert Scott and his successors in adopting this mode of treatment. The colour of the stone was such that the two materials blended together in perfect harmony.

PHOTOGRAPHY AS APPLIED TO ARCHITECTURAL MEASUREMENT AND SURVEYING.*

By J. BRIDGES LEE, M.A.

MOST people are in the habit of looking upon photographs as more or less artistic or inartistic pictures destined to convey impressions more or less accurate or inaccurate of what things look like. Comparatively few people have yet acquired a habit of regarding photographs as accurate measureable records of external facts.

The first important generalisation we can arrive at is that the picture surface can only be an exact copy of the thing depicted when that also is a similar surface, and only then when the picture surface was parallel to the object surface at the time when the picture was taken. We may conveniently regard a photographic picture as a radiant production every point of which is at the end of a straight line coming from an apical point somewhere in front of the picture. Generally that point is somewhere inside the body of the lens, but it may be outside, either before or behind the lens, and it is called the station-point. The picture yielded by the lens is the same as would be obtained by a simple pin-hole at the station-point; a good lens gives a brighter and more sharply-defined picture than a pin-hole, but otherwise the pictures are the same in size and outline.

With this conception always in mind that a photographic picture is a collection of points at the ends of straight lines radiating from the station-point in the same directions as corresponding straight rays of light which have originally travelled from the objects depicted to that point or its adjacent counterpart, a correct understanding of many of the problems of photographic geometry becomes simple and easy. It becomes clear at once that when the true position of a picture is known with reference to its station-point any number of direction lines from the station to points on the objects depicted can be ascertained with ease, because they will be the same as the direction lines from the station to the corresponding points on the picture. To fix the actual positions of the object points it is sufficient to know their several directions from a known point and the distances of those points along the direction lines. Generally it is not convenient or easy to determine directly the distance of a point along a radius of direction. The most convenient and best way for general purposes is to find the horizontal distance first, then the altitude, when the actual line or distance will be the hypotenuse of the right-angle triangle of which the horizontal distance and altitude are the sides containing the right angle. To find the horizontal distance a method of intersection similar to the plane table method of land surveying is used. Photographs of the same objects are taken from different stations. The direction rays to any point whose position is required are observed and projected on a ground plan, when the intersection of the projected rays will mark the position of the point on the ground plan. The altitude can then be ascertained by determining from the picture the angle of elevation and computing the height which would subtend the observed angle at the distance already ascertained on the ground plan. Also the altitude will be a fourth proportional to three lengths, which can be measured directly. These are (1) the distance from the station to the projection of the image point on the horizontal trace of the picture plane. (2) The horizontal distance of the point from the station measured in scale feet on the plan. (3) The measured height of the image of the point on the picture above or below the horizon.

Or it may be determined by substituting values in a general formula $h = d \tan \alpha$, where h is the altitude above or below the station, d is linear horizontal distance, α is the angle of elevation observed from the station and \tan , and is $\frac{y}{\sqrt{f^2 + x^2}}$, where f is focal distance and x and y are abscissae measured from the centre on the

horizon and principal vertical lines as rectangular co-ordinates.

In practice there are no considerable difficulties provided we have enough accurate information about the pictures which are used.

The methods so far considered and explained in outline relate only to the fixing of points on a ground plan by the methods of intersections and of elevation by the particular methods described. These methods are almost universally applicable, and with moderate care they yield very accurate results with much less expenditure of time, money and effort than would be needed for an ordinary survey of the same ground with a plane table or any of the other known methods of surveying. In Canada this method has been largely used, and it has been found that the actual money-saving from using the photographic method was then two-thirds of the computed cost of a plane table survey. A similar saving has been computed as the result of using this method for the survey of the Trans-Baikal Railway in Siberia; and it seems reasonable to believe that with the improved instrumental appliances of the present time, and others perhaps to follow, the saving of expense for surveys hereafter will be from 80 to 90 or perhaps even 95 per cent. of the cost of similar surveys in the past by old-fashioned methods.

When dealing with buildings it is often

up the camera perfectly square in both instances, the images of the vertical hair on the face of the building will include between them a slice exactly as broad as the measured distance between the two camera stations.

One way to investigate flat surface areas is to apply what is known as the method of squares. If we imagine a plane area to be entirely made up of small squares, then the position of any point in the area is sufficiently determined if it is known in which square it is located and what is its position in the square. When dealing with a front view it is sufficient to superpose on the picture a sheet of glass on which has been ruled or photographed a network of regular squares in elevation. If the focal distance of the picture be known, it is a very simple matter to compute the scale value of the squares for different distances of the object surface.

Next in order of simplicity of measurement to a simple frontal view of a plane surface will be a horizontal surface or plan. For practical work regular series of perspective squares may be engraved or photographed on flat sheets of glass to make what are called perspectometers, which can be laid in position on the photographs with the scale surface next the picture face. These perspectometers need to be specially constructed with precise reference to the focal length of the lens in each case.



HALL IN HOUSE, NORTH HILL ROAD, HEADINGLEY, LEEDS.
ALBERT E. DIXON, A.R.I.B.A., ARCHITECT.

possible for the photographer, without difficulty or much loss of time, to measure directly with a tape the perpendicular distance from the diaphragm of his lens to the wall of the building to be photographed. This distance can be noted on the picture. The scale can then be calculated and constructed in a few minutes, and all distances on the surface elevation can be measured directly with a pair of compasses and that scale.

Distances on parallel surfaces nearer or further away, such as projections, porches, deep-set windows or other recesses, will require different scales of measurement according to their distances in advance of or behind the principal surface, or the same scale can be used for measurement and the results divided or multiplied by a constant computed for the difference. Another way to get the scale is to place a rod of known length in close contact with the surface where its image will be entirely included in the photograph.

Sometimes it is not convenient to walk up to a building to measure the distance to it or to place a measured length against it. A very efficient plan then is to shift the camera a measured distance to the right or left parallel to the face of the building, and take a second picture, when, if due care has been taken to set

The method of squares which has been spoken of as applicable to the measurement and plotting of elevations and plans can be applied also for the measurement of other receding flat surfaces, such as the roofs or walls of buildings.

Sooner or later the time will come when photographic projection will be systematically employed for teaching perspective, and it will be employed practically, on a large scale, for projecting images from one plane to another. We must not expect to obtain full knowledge of unknown objects of three dimensions by aid of a single photograph, or even a number of photographs from a single point of view. To study unknown objects thoroughly we need to be able to examine them from several different points of view and to compare the views. The use of photography does not obliterate this necessity, though it helps very decidedly towards correct final conclusions, because it records faithfully the appearance observed at every station, and these views from different stations can be brought close together and directly compared.

[Note.—A paper by Mr. Bridges Lee on "The Geometric Interpretation of Photographs as applied to Surveying and Other Purposes," with illustrations, was published in THE BUILDERS' JOURNAL for January 15th last.]

* Summary of a paper read before the Society of Arts on April 16th, 1902.



GROUND PLAN.



FIRST-FLOOR PLAN.

HOUSES, NORTH HILL ROAD, HEADINGLEY, LEEDS. ALBERT E. DIXON, A.R.I.B.A., ARCHITECT.

Engineering Notes.

The City of Sheffield Smallpox Hospital has been supplied with Shorland's double-fronted patent Manchester stoves in glazed faience, and patent Manchester grates, by Messrs. E. H. Shorland & Brother, of Manchester.

Buckingham Palace Lake. Various improvements have been made in the grounds of Buckingham Palace. The ornamental lake in particular has been extensively altered. It was a large basin with a total depth of about 7ft. from the lowest point to high-water mark, and had sides sloping outwards at a very sharp angle. The appearance of the water at its edge was consequently most deceptive, and the lake might well have been found dangerous. As a much shallower depth would be ample for ornamental purposes and equally effective for boating, about 3ft. of the basin have been razed off and the surrounding lawns treated in proportion. The fountain in the centre has been removed.

For the Purpose of Supplying Water to Derby, Leicester and Nottingham, and the counties from which these great towns take their name, the Derwent Valley Water Board are "tapping" the dales of Derbyshire and constructing a series of gigantic reservoirs which it is computed will hold about ten thousand million gallons of water when completed. This great enterprise is being carried out by an association of local authorities forming the Board. Of the five reservoirs decided upon, two will be constructed above Derwent Hall, two in the Ashop Valley and one near Bamford. Each reservoir will be two miles in length, and the construction of the railway, which is a necessary preliminary to the work, is nearing completion. The construction of the first great dam is now in its initial stages. The colossal character of the undertaking may be realised from the fact that the watershed extends a distance of about forty miles, and that twenty years will probably elapse before all is finished. The engineer for the scheme is Mr. Edward Sandeman, who designed the great Plymouth reservoir at Dartmoor. The Derwent Valley Board are themselves carrying out the work under Mr. Sandeman's supervision.

The Institution of Mechanical Engineers held its annual dinner last Thursday at the Hotel Cecil, the president, Mr. William H. Maw, occupying the chair. Lord George Hamilton, in response to a toast, said it was his desire that all orders in connection with Indian railways should be placed within the limits of the British Empire. During the last two or three years certain orders had gone abroad because the British manufacturers had not been able to comply with the time limit that it had been necessary to impose.

At his request a conference had been held at Calcutta, at which the representatives of the leading Indian railways had been present, to discuss the important question of standardization. He believed that if a satisfactory conclusion could be arrived at on this subject one of the main obstacles which now prevented the locomotive factories of this country from complying with requirements in times of emergency would be to a large extent mitigated. The Japanese Minister, Viscount Hayashi, observed that in the early part of the last century the Emperor of Japan, thinking it most important to develop the material resources of his country and to educate his people in the sciences, applied for the assistance of engineers and professors in this country. The progress that had been made in these matters by Japan was owing a great deal to the advice of gentlemen connected with the Institution of Mechanical Engineers and with kindred institutions.—At a meeting on Friday last Mr. Robert E. Atkinson read a paper on "The Standardization of Pipe Flanges and Flange Fittings."

DISAPPEARING EDINBURGH.

OLD Edinburgh is rapidly disappearing. Year by year ancient buildings vanish; soon all will have gone, and from High Street everything venerable from its historic or traditional associations will have passed away. Time was when the close packed and high-piled alleys demanded a thinning out in the interests of sanitation and of decent living. That time, however, is long gone, and now the question is not what must needs be demolished, but what can and ought to be preserved. A group of antique buildings, of more than common interest and value, is being swept away even now. These tenements, situated between Bailie Fyfe's and Morrison's Closes, are unusually good examples of old Scottish domestic architecture. On the street elevation some of the fronts have been modernised, but in the rear the features of a former age are striking and conspicuous. In Bailie Fyfe's Close the group terminates to the north in a lofty tower-like structure, gabled and crow-stepped. Adjoining it a picturesque combination of dormers and chimney stacks leads up, at the end next the High Street, to a tall staircase with two beautifully-moulded doorways, one giving access to a large hall a few steps higher than the ground floor, the other leading to the upper storeys. A bold string-course above the two doorways unites and harmonises the composition. A little to the north of the two doorways just described a low-browed, cellar-like opening gives access to a vaulted

passage leading in the direction of Morrison's Close, whither we shall now proceed. Passing down Morrison's Close from the High Street, we come at once to another common stair, enclosed in a lofty square tower rising above the level of the Close to a height of seven storeys, and giving access to an imposing structure united on the west to other buildings equally striking, which extend as far as North Gray's Close. These houses, viewed from the close, are, or rather were, of a most stately and picturesque character, amply realising all that has been said by Daniel De Foe, Taylor, the water poet, and other visitors of former days, in praise of the great edifices of stone which adorned the ancient capital. Returning to our stair-tower we find a succession of short flights of easily-graded steps carried by a centre wall which, on each landing, terminates in a half-column with finely-chiselled capitals and bases. Each step carries a bold moulding on all three edges, and the whole aspect is rich and effective. Proceeding down the Close we come to what is now an open yard, formed by the back of the buildings in High Street and Bailie Fyfe's Close. From this yard the buildings to the north and west have been removed some time ago. The vacant space reveals the fact that the entire group has rested on vaulted basements of stone, solid and massive as those of an ancient castle. Access to these buildings, which had enclosed a small and almost secret quadrangle measuring about 20ft. by 12ft., was obtained by the low-browed and cellar-like door already described in Bailie Fyfe's Close.

Inside the quadrangle at the north-west angle, and on the level of the first floor, appeared a deeply-recessed Latin cross about 3ft. 6in. in height. Nothing further could be made out from beneath, but an ascent to the first floor opened on a large hall about 39ft. by 15ft., at an inner angle of which, within the longer limb of the Latin cross, was found a narrow lattice window of leaded glass—one of the rarest things of its kind in old Edinburgh. About the middle of this hall, on the west side, was a tall mullioned Gothic window. It was flanked on the north by a magnificent fireplace, with bold mouldings and clustered columns which sustained a massive monolith lintel about 8ft. by 2ft. The stones forming the fireplace are now heaped together in the yard. All that remains of this remarkable group of buildings is now in process of demolition. In its place we are to have a number of new erections, the frontage to the High Street to be built of stone, but the buildings behind are to be simply brick tenements of the usual shoddy type, as destitute of human interest as of architectural quality.—(Extracts from an article in the "Scotsman.")

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication

Fountain Court, Hampton Court Palace.

LONDON, S.W.—G. A. H. writes: "Where could I obtain working drawings of Fountain Court, Hampton Court Palace, suitable for making a perspective drawing?"

Two plans and an elevation, made by Mr. Alfred Cox, A.R.I.B.A., in 1888, are to be consulted at the Library of the Royal Institute of British Architects, 9, Conduit Street, W., while two elevations by Mr. P. L. Marks were published in the "Builder" for March 24th, 1888. G. A. T. M.

New Police- and Fire-Brigade Stations.

WEST HARTLEPOOL.—H. B. writes: "Kindly mention the best police- and fire-brigade stations that have been recently erected."

In London a new police station (the largest of its kind in the Metropolitan district) has been built in Cannon Row, New Scotland Yard, from the designs of Mr. J. Dixon Butler, and a small police-station by the same architect has been built in Hyde Park in place of the old one that did service for so many years; a new station for the Metropolitan Fire Brigade has been erected at a cost of £12,000 in West End Lane, Hampstead, from the designs of Mr. W. E. Riley; a new fire-station has been built in the Euston Road at a cost of £21,000; another at Islington; and another at East Greenwich (this being at the junction of Horn Lane and Tunnel Avenue with Lower Woolwich Road—cost £13,100). In the provinces a very large fire- and police-station is being erected at Manchester from the competition designs of Messrs. Woodhouse & Willoughby (estimated cost, £110,000); new police courts and sessions house are to be built at Blackburn; a new police- and fire-brigade station has been built at Cambridge (see our issue for November 13th, 1901); a new central police-station is being built for the city of Hull (see our issue for September 11th, 1901); a new fire-station is to be erected in Westgate Street, Cardiff, from the plans of the borough engineer, Mr. Harper (estimated cost, £15,250); a new town hall and police-station has been built at Ilford at a cost of £30,000; a new fire station at Stockport (£12,000); and a new central fire-station has been erected at Scarborough.

Obtaining Faculty to Church Alterations.

STROOD.—A. CAMPANILE writes: "How does one obtain a faculty for building a heating chamber and vestry to a church, and also for executing needful repairs, including filling-up graves (if any), laying 6in. concrete and wood block (or tile) floor? Please state to whom one must apply, whether detailed specifications and drawings are necessary, and any other particulars."

I believe that application has in the first instance to be made to the bishop of the diocese, though the faculty would eventually be granted by the Dean of Guild Court. A full description, together with drawings, specification and estimate from a responsible contractor should accompany the application. G. A. T. M.

Colours to Withstand Exposure.

READING.—B. A. F. writes: "Kindly recommend what to use to get this colour (vermilion) and also a light wash of crimson lake on an ordnance sheet, which will last exposed to slight damp and the strongest sunlight. I have tried Higgins's vermilion waterproof ink, but this faded in about three weeks in the weak sunlight which we have had lately."

Try the colours made by Mr. A. G. Thornton, St. Mary's Parsonage, Deansgate, Manchester.

Questions of House Tenancy.

LONDON, W.—A. H. writes: "(1) When must the key be given up to terminate a tenancy? Supposing some premises had been vacated, but the keys were omitted to be surrendered, could

the landlord claim rent afterwards? (2) If the tenant's fixtures are left on the premises after possession has been given up, because they were not worth removing, can the landlord claim a dilapidation for their removal or for the making good afterwards? (3) If an agreement has been signed, and stamped, to rent premises for the remainder of out-going tenant's term, namely, nine months, with a clause inserted to the effect that the tenant has the option at the end of the term to continue occupation for a further term of three years, how long does it hold good? Is it necessary at the end of the first term to have fresh agreement?"

(1) If notice has been given to terminate the tenancy of any dwelling-house, and the rent has been paid according to the terms of hiring, the key should at once be given up unless you have terms of acquittance signed by the owner or his agent; otherwise you may be liable for any and every accumulation of rent, even if you have given notice, unless you have taken the receipt and acquittance which is required by law. (2) Tenants' fixtures cannot be removed after possession has been given up; neither can the landlord claim dilapidation for them if they were taken by you from the previous tenant, and left by him with the consent of the landlord. All new fixtures erected by yourself the landlord can, unless erected with his consent, compel you to take away and make good any damage caused by removal. (3) If the agreement has been properly signed and stamped, with the landlord's signature attached, it will be necessary to get the lease renewed, at or before the expiration of six months, for a new term of agreement.

J. E. BRAND.

Iron Doors in Party Walls.

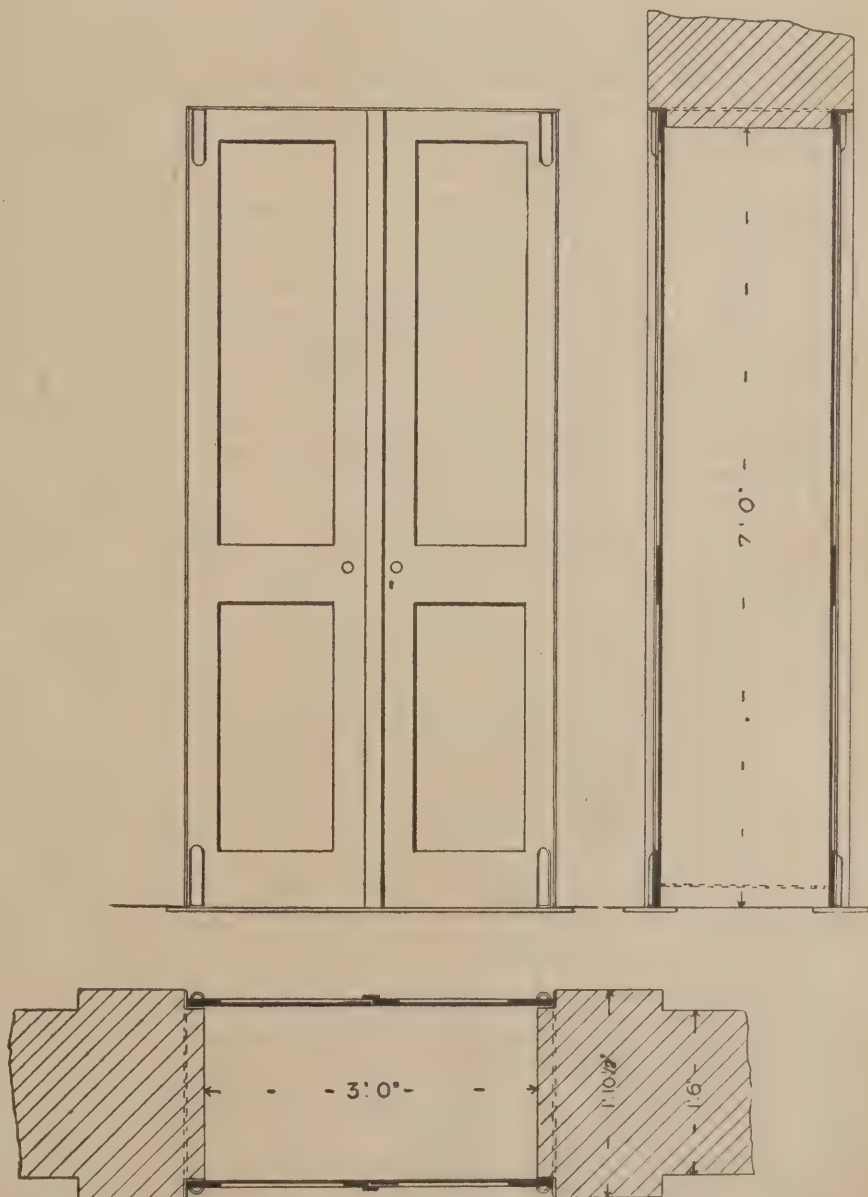
PORTSMOUTH.—STUDENT writes: "Kindly answer the following question set at a recent examination: 'Draw plan and section of double iron party-wall doors, hung folding, with iron rebated frames, in an opening 3ft. wide by 7ft. high, between two warehouses.'"

Iron doors would not usually be hung folding in an opening only 3ft. wide. By the London Building Act of 1894 an opening shall not be made in any party wall or in two external walls dividing buildings which if taken together would extend to more than 250,000 cub. ft., except under the following conditions: (a) Such opening shall not exceed in width 7ft., or in height 8ft., and such opening or openings taken together shall not exceed one-half the length of such party wall on each floor of the building in which they occur; (b) such opening shall have the floor, jambs and head formed of brick, stone or iron, and be closed by two wrought-iron doors, each $\frac{1}{2}$ in. thick in the panel, at a distance from each other of the full thickness of the wall, fitted to rebated frames without woodwork of any kind, or by wrought-iron sliding doors or shutters, properly constructed, fitted into grooved or rebated iron frames; (c) if the thickness of the wall be not less than 24in., or the doors be placed at a distance from each other of not less than 24in., such opening may be 9ft. 6in. in height. The accompanying illustration shows the required answer to the question.

HENRY ADAMS.

Design for Roof-Truss.

WELLINGBOROUGH.—BASS FLUTE writes: "I send rough section through small schoolroom



IRON DOORS IN PARTY WALLS.

(not reproduced). Is the construction safe, or should iron king and tie rods be used? The principals are 9ft. apart."

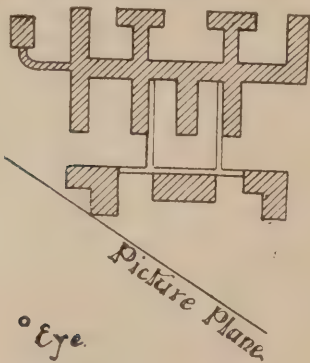
The construction shown will be safer if it has 1½ in. by ½ in. stirrups at the three points where the laminated rib touches the collar beam and principal rafters, with bolt ends screwed ½ in. and with a 2 in. by ½ in. plate across the top to take the nuts. There should also be a 1½ in. by ½ in. strap round the bottom ends of the rib, which may be bolted through the wall piece, but it would be better made as a stirrup with the bolt ends carried through the wall and nuts on the outside.

HENRY ADAMS.

Making Perspective of Asylum Buildings.

OXFORD.—PERSPECTIVE writes: "I am about to make a perspective of a large block of asylum buildings and I want to show them as seen from an elevated standpoint. What should be the height to show buildings about 1,000ft. to the rear of front block; and what should be the distance in front of the picture-plane in order to avoid a distorted appearance?"

The accompanying plan shows what in my opinion are likely to prove the best positions for picture-plane and "eye," the latter being located about 250ft. above ground and 350ft. in advance of the picture-plane. It is, however, very much indeed a matter of taste, and local



circumstances may render a view in parallel perspective more suitable, such as would be obtained by locating the eye where shown on the sketch supplied with query. G. A. T. M.

Strength of Roof-Trusses.

NORTHAMPTON.—PARISH ROOM writes: "I cannot find formulæ or diagrams to enable me to find out authoritatively the scantlings for the roofs shown on the enclosed sketches (not reproduced). Are the scantlings as figured sufficient?"

There are no formulæ or diagrams applicable to the trusses shown on your tracing. The lean-to shed roof should have a cleat on the post under the tie-beam (unless the latter is let in on each side), and an angle brace or curved bracket should be fixed between the post and the tie-beam. The wall end of the truss should have a stone template under the tie-beam. The posts should be protected from wet lodging against the foot and from other damage by a splayed and mitred skirting 7 in. high; the bed upon which it rests should also be weathered. The scantlings shown for this roof are very light, but appear to be safe. The connection of the parts of the roof-truss for the upper hall is not quite clear. The principal rafters must not be less than 9 in. by 3 in., the collar beam and angle filling-pieces being of the same size; the latter, forming the curve, must be bolted through to the principal rafters and collar beam by bolts not less than 3 ft. apart; the pitch-pine facing will then come outside all these timbers. The wall should be 1½ bricks thick at the very least, or should have substantial piers at each truss, say, not less than 18 in. by 9 in.

HENRY ADAMS.

Quantities in Contracts.

IPSWICH.—QUANTITY writes: "(1) 'The bills of quantities will form the basis of the contract. The contractor is to furnish the architect with a priced copy, and all variations will be valued in accordance with these prices.' Does this clause

make the quantities part of the contract, and can the contractor claim for any omissions or errors in them? (2) Please recommend a simple book on single and double entry book-keeping for builders."

(1) The clause makes the quantities part of the contract and the contractor can claim for omissions or errors in them, and likewise reductions can be made if the errors are in favour of the contractor. (2) We cannot recommend any of the books on book-keeping for builders.

Architects' Certificates.

CARDIFF.—ENQUIRER writes: "I send you a copy of an architect's certificate and should be glad to know the proper way to fill it in (1) when granting a certificate on account of work done under a contract; (2) when granting a certificate for extras on a contract; (3) when granting a certificate for full amount of contract and extras, keeping only the usual retention money in hand for a stated time; (4) when granting a final certificate which includes all retention money kept back and remaining amount, if any, of the contract amount and extras."

The form of certificate you send is hardly adequate enough; it should be larger, so as to allow more particulars to be given. (1) State the sum, name of job, nature of work and the number of the instalment. (2) State the sum, with words "on account of extras to"; then follow with name of job. (3) State sum, "on account of works completed at (name of job) making in all — per cent. of the total value of the works, inclusive of extras value — on the amount of the contract and leaving a balance due to him (contractor) from you (client) of £ —, that is — per cent. of the total value of the works, pending the issue of my final balance certificate." (4) Add words "being the final balance due to you from (name of client) in settlement of all claims you have against him and relieving you from all further liability under the agreement made (date of builder's agreement)."

Assistant Architect and Surveyor, Office of H.M. Works.

B. J. writes: "Kindly state how to obtain an official nomination for this examination, also the range of knowledge required for the various subjects. Papers (of nomination examinations) previously set are not published."

Applications for official nomination should in the first instance be addressed to the Chief Surveyor, H.M. Office of Works, Storey's Gate, S.W. Such nominations, however, are rarely given to any who are not temporarily employed in the department and of whose capabilities the "Chief" has knowledge. As a rule the first step is consequently to obtain temporary employment as a draughtsman. The range of the examination has not materially altered from what it used to be when the appointments were open to public competition; while there is no "standard" of knowledge which ensures success. As a rule three candidates, all capable men, are nominated for each vacancy. Those who score most marks, provided they reach a comparatively low grade of efficiency (as almost all succeed in doing), secure the vacant posts. The requisite standard for success therefore depends upon the mark-obtaining abilities of the other competitors, and as this may on any occasion be exceptionally high it is impossible to be too well prepared for an examination, especially as seniority for promotion ranks in order of merit.

G. A. T. M.

Concrete Piers.

LIVERPOOL.—HAZELWOOD writes: "What is the safe load per ft. super. for concrete piers? Would 15 tons per ft. super. be the maximum for a pier 4 ft. square and 30 ft. high? What is the best proportion of materials for the above class of work? May 6 to 1 be taken as perfectly satisfactory?"

The load on a pier 4 ft. by 4 ft., 30 ft. high, should not be more than 10 tons per ft. super.; the safe load we advise is 8 tons on a pier composed of 3 parts of broken brick to 1 of cement: 6 to 1 is unsatisfactory in a pier, though reasonable in foundations. If 6 to 1 were the proportion, the safe load would be 4 tons per ft. super.

New Patents.

These patents are open to opposition until May 26th.

1901.—Wood-Carving Machines.—5,799. THE BRITISH CHARRIER WOOD CARVING CO., LTD., 49, St. Mary Axe, London, E.C. (communicated by L. C. H. Charrier, Vendome, Loir et Cher, France). This is an improvement on the machine described in specification No. 25,003 of 1894. A reciprocating beam is provided to carry a number of independently-working tools and pressers in combination with a movable part of the frame below the work for actuating other tools.

Removing Pitch, &c., from Stones, &c.—6,982. W. MORTON, 33, Elizabeth Street, and J. H. BRADSHAW, 62, Dale Street; both of Liverpool. This invention more especially relates to the removal and recovery of pitch from paving setts of torn-up roads. The apparatus consists of an oven mounted on wheels and having an endless screen travelling throughout its length. The setts are placed on this screen, the pitch is melted off as they pass through the oven, and the cleaned stones are discharged at the other end.

Tile Manufacture.—7,814. R. LOSS, 34, Kronenstrasse, Hanover, Germany. Completely-finished tiles are made in one operation from a strip of clay forced out of the pug mill. The clay passes between a pair of moulds carrying rollers—the moulds in each roller being half the depth of the tile—and is thus pressed into shape and cut off. Nibs are also formed automatically.

Bricks.—9,742. J. ASHWORTH, Middle Beck-side House, Dalton-in-Furness. The brick is made with a depending overlap covering the joint and so preventing the entrance of moisture.

Rainwater Troughing.—25,261. W. WHALLEY, 354, Colne Road, Burnley. The troughing is of salt-glazed earthenware in short lengths made integral with the wall plate and jointed with cement. In a modification, the wall plates are dispensed with and holdfasts used for supporting the troughing.

The following specifications were published on Thursday last, and are open to opposition until June 3rd. A summary of the more important of them will be given next week. The names in italics are those of the communicators of the inventions

1901.—5,681, DEVILLE, lifting jacks. 6,479, ROBB, combination instrument for taking bevells, measuring angles, &c. 7,122, YOUNG, fireproof and soundproof floors, partitions, &c. 7,269, BOUSFIELD, top-running rails for sliding doors. 7,276, HUMPHREYS & READ, apparatus for opening and closing gates, doors, &c. 7,762, TAILBY, saw benches. 7,827, DEFRIES & FEENEY, binges. 8,118, BOYLE, downcast ventilators. 8,169, RODNEY, locks or latches. 8,184, HARRICH, system of construction with beton strengthened by metal. 8,453, ANGER, mechanism for operating ventilating sashes. 9,197, HEATH, ascertaining height of an object or the distance of one object from another. 9,317, PRUCE, apparatus for opening and closing fanlights, &c. 10,591, ROLLINSON, tubular or timber expansion framings and scaffolds. 10,646, ROBERTSON, double-hung sash and cased windows opening inwards. 11,884, HAYDOCK, hand planes. 13,643, LAKE (*Piccard, Pictet & Co.*), crushing mills. 14,703, LEGGOTT, openers for fanlights, &c. 18,837, COOMBS, sanitary refuse receptacles. 23,057, GÖLKEL, clamping device for work benches. 23,488, ADAMS, methods for "setting" articles in kilns. 24,019, OSBOURN, dirt traps for steam-heating systems.

1902.—632, BROWN, draw-off taps. 1,819, GOODRIDGE, non-septic purification and utilisation of sewage from country mansions and large houses. 2,848, STROHM, circular saws. 3,441, ECKSTEIN, window sashes, casements, &c. 3,506, WILSON, shutters, doors, &c. 4,019, NEWTON (*New Jersey Wire Cloth Co.*), fireproof constructions. 4,140, FLANAGAN, metal roofing sheets. 4,160, MEYER, stop cocks.

Law Cases.

Sealing of Agreements with Local Authorities.—The case of *Lawford v. Billericay Rural District Council* was recently heard in the King's Bench Division of the High Court of Justice. The plaintiff sought to recover the sum of £169 14s. as remuneration for his services as an engineer in preparing a report and plans and performing other duties in connection with a sewerage scheme which was being carried out by the defendants. The defence was that the agreement on which the plaintiff relied was not a valid agreement binding on the defendants because their common seal was not affixed to it. In giving judgment Mr. Justice Darling said he regretted to have to come to the conclusion that it was necessary, in order that this agreement should be binding upon the defendants, that it should be under their common seal. No decision, so far as he could find, had got rid of the principle defined by Lord Denman in the case of *Church v. Imperial Gas Co.* (6 A. and E., 846) and which was assented to by the Court of Exchequer in *Mayor of Ludlow v. Charlton*. The common seal of the defendants had been put to the original drainage scheme, and to have exacted the use of the seal in the case of the extension scheme could not have caused great inconvenience or have tended to defeat the object for which the corporation was created. The plaintiff chiefly relied on *Clarke v. Cuckfield Union*, but, in his Lordship's opinion, that case did not avail the plaintiff. He could not find the rule anywhere laid down that the objection of the want of the common seal could only be held good in the case of executory contract. Judgment for the defendants.

An Architect's Action for Slander.—On Friday last in the King's Bench Division of the High Court of Justice the case of *Low v. Tinnelly* was heard. The plaintiff, Mr. W. R. Low, architect, Basinghall Street, sued Mr. Thomas Tinnelly, a member of the Feltham School Board, to recover damages for slander. It appeared that the plaintiff was employed by the Feltham School Board to prepare plans and specifications and take out quantities for the erection of a school for them, and according to his case the specification, as usual, provided that the charges of the plaintiff for the preparation of the quantities and lithographing them should be paid by the contractors. The defendant, it was said, on July 16th, 1901, convened a meeting at the Board school, Feltham, which he hired for the purpose, and at which he spoke the words complained of. They were to the effect that the contractor had to submit to a specification drawn up by Mr. Low, "by which Mr. Low collars his fees twice over, and no contractor gets a chance unless he submits to what I call a downright fraud." The defence was a denial that the words complained of were spoken and that the provision of the specification as to the architect being paid by the contractor for the preparation of the quantities and lithographing was usual. Further, it was denied that the words bore the meaning which plaintiff alleged, and it was pleaded that they were, if spoken at all, uttered without malice in the belief that they were true, and, being addressed to the defendant's constituents and ratepayers of Feltham, were privileged. The learned judge held that the occasion was privileged; but declined to hold that there was no evidence of malice. There was, he thought, strong evidence if the jury believed that the defendant was not using the privileged occasion as such. If the defendant said that the plaintiff got his fees twice over he thought that was an abuse of the occasion. Therefore, the question came back to whether defendant used the words. The jury said they found the words complained of were used, and that they exceeded the privilege of the occasion—that they were used recklessly rather than out of spite, and they awarded the plaintiff £50 damages. Judgment accordingly.

"Design Laying" is the title of No. 44 of the "Useful Arts and Handicrafts" series issued by Messrs. Dawbarn & Ward, Ltd., 6, Farringdon Avenue, E.C., price 6d. nett. It is written by Mr. Thomas Bolas, F.C.S., F.I.C., and describes the methods of tracing, transferring, reversing, enlarging, reducing, repeating and fitting designs for use on all kinds of fabrics and materials.

Views & Reviews.

Fletcher on Light and Air.

This new edition of the late Professor Banister Fletcher's well-known book has been revised and rewritten by his sons, and full reports are included of the recent important appeal cases of *Warren v. Brown* and *Home and Colonial Stores v. Colls*; other modern decisions being also given, and six new coloured plates added illustrating the effect of new buildings on existing easements. Reference is made in an "introductory note" to the recommendations of the joint committee of the Royal Institute of British Architects and the Surveyors' Institution which sat to consider the existing law of light and air, but the authors are not of opinion that the methods suggested by that committee will justly meet the requirements: they are inclined to think that the present methods are the best, with the exception that a professional assessor or assessors might sit with the judge, as is customary in the Admiralty Division. Moreover, they observe that the committee seem to have overlooked the fact that, if the easement to light and air is to be abolished, this should also apply to any other kind of easement—"A purchaser is as much entitled to buy a house with dominant lights as he has (*sic*) to buy one with any other easement, such as a right of support, &c." The twenty-seven diagrams of cases at the end of the book, with their accompanying letterpress, are most useful in illustrating the various decisions; while the numerous details of the law are clearly set forth and explained in the several chapters. The book is well arranged, and reference is consequently easy.

"Light and Air," by the late Professor Banister Fletcher, 4th edition, revised by Banister F. Fletcher, A.R.I.B.A., F.S.I., and H. Phillips Fletcher, A.R.I.B.A., A.M.I.C.E., barrister-at-law of the Middle Temple. London: B. T. Batsford, 94, High Holborn, price 6s. 6d.

The Great Smoke Plague.

This is a practical book on smoke-prevention and should be in the hands of all those interested in the problem. Since 1890 the author has been Chief Smoke Inspector for the city of Sheffield, and having in addition read most that has been written on this subject and seen almost every device that has been discovered, he is in a position to speak with authority on the matter: and he does so briefly and lucidly, wasting no words on theories, but devoting himself entirely to the existing conditions of things, describing what has been done, and making suggestions for further improvement. For the sake of clearness he assumes that there are two kinds of smoke—preventable and unpreventable; meaning by the former that thick black smoke, or unburnt carbon, which can and ought to be consumed; and, by the latter, smoke which has lost its carbon constituents and is thin and of a varying colour when emitted from the chimney. The author observes that those who say hard things against the local authority for their inactivity and supineness in not suppressing smoke other than black would do well to remember that the authority has no power to do so; though it is very evident that such power should be given; and the author suggests that section 91 of the Public Health Act, 1875, should be amended by the substitution of the word "dense" in place of "black." The prevention of smoke from private dwelling-houses and from steam boilers is dealt with (a long chapter being devoted to smoke-preventing appliances for the latter), and reference is also made to cures, special and gas-fired furnaces, and to metallurgical furnaces: as regards the last, the author demonstrates that the doors used are of the wrong kind so far as smoke-prevention is concerned. The difficulties attendant on the prevention of smoke from sheet mill and similar furnaces are many, but it has been proved that much of the smoke can be prevented without injury to the trade and without restricting the output; throughout the book, however, the author emphasises the necessity for the fireman or stoker to co-operate with the machinery provided, and to use it intelligently—"he can, if he will, prevent at least 80 per cent. of the smoke which is now being belched into the atmosphere." In view of the fact that the smoke from dwelling-house chimneys is so largely responsible for the existing evil in towns and cities, it is to be

regretted that the author has not devoted more space in illustrating and describing the chief smoke-consuming devices introduced by numerous firms, in the same way as he has dealt with the various smoke-preventing appliances for boilers and furnaces.

"Practical Smoke Prevention," by William Nicholson. London: The Sanitary Publishing Co., Ltd., 5, Fetter Lane, price 3s. 6d. nett.

Conditions of Contract.

By writing this very able book Mr. Macey has performed a service to architects, builders, lawyers and others materially affected by the conditions of contract in building works. Conditions of contract are such all-important documents that it is surprising a similar treatise has not appeared before, as the legal decisions and other matters relating to the general conditions were formerly only to be found distributed in many books and periodicals. The book is arranged on the convenient principle of enumerating each clause in order and explaining it by notes below. In addition, however, tables of cases, short summaries of the decisions, suggested forms of tender, agreements, schedules of prices &c., are given. Of course, such a large work of this kind is not in handy form or short enough for use as a reminder in everyday practice in writing specifications, but it should be read thoroughly by all architects and contractors, and the subject mastered. The book contains, we are glad to see, a glossary of terms, and there is a good index at the end—a most important requirement in a work of reference.

"Conditions of Contract relating to Building Works," by Frank W. Macey. Revised as to strictly legal matter by B. J. Levenson, Barrister-at-Law. London: Sweet & Maxwell, Ltd., 3, Chancery Lane, W.C., price 15s. nett.

Bridge Construction.

It is unnecessary to review at great length the third edition of Professor T. Claxton Fidler's "Bridge Construction," as this standard work on the subject is so well known. This edition has been revised in connection with railway bridges, for, on account of the continued increase in the power and weight of locomotives entailed by the growth of railway work, the consequent heavier loading of bridges has necessitated a change in practice. The calculated tables giving the sectional area of struts are extended to include struts of mild steel. The general title of the book is misleading, as iron and steel bridges only are dealt with, and no reference is made to bridges of stone, concrete and wood, as might be expected from the title: indeed, we think it a pity that Professor Fidler has not extended it to cover the whole subject of bridges, which would not entail a very large addition; or he might write a companion volume. The omission cannot be defended on the grounds that iron and steel bridges are the cheapest and most convenient, and therefore should be the stock-in-trade of the engineer, for it has been found in America and elsewhere that granite and concrete bridges offer considerable advantages over iron ones, both in cheapness and lasting quality. Then, again, for temporary work timber bridges are undoubtedly the cheapest, and if built more substantially might last fully half a century, or longer: for footbridges over railways, canals, &c., they should be more extensively adopted. For some time past there has been much talk about the need for the co-operation of the architect with the engineer in the design of bridges, and this book provides many instances of illogical designs, which are not final in their form; that is, they are not functional. It will, however, be necessary for architects, before they can expect to be fitted to advise, to possess a considerable knowledge of the problems entailed in the design of bridges, and there is no better work for this instruction than Professor Fidler's treatise. It is quite wrong to suppose that a work of art can be secured by adding ornament to the engineer's skeleton; the architects must take a hand in the modelling of the structure throughout in order that it may be made organic.

"A Practical Treatise on Bridge Construction: being a Text-book on the Design and Construction of Bridges in Iron and Steel," by T. Claxton Fidler, M.I.C.E., Professor of Engineering, University College, Dundee. Third Edition. London: Charles Griffin & Co., Ltd., Exeter Street, Strand, price 30s.



ANCEY GATEWAY.

A CRITICISM OF THE BY-LAWS.

A PAPER on the building by-laws of Plymouth was read by Mr. Arthur S. Parker, A.R.I.B.A., before a recent meeting of the Three Towns Branch of the Devon and Exeter Architectural Society. Mr. Parker said that the Plymouth by-laws were largely a copy of the Model By-laws of the Local Government Board. Although the model code was framed on sound general principles, it had also been found to be imperfectly suited to rural districts, and the Local Government Board had recently issued, by request, a modified code for rural district councils. In the modified by-laws no proper allowance was made for sanctioning temporary iron churches, chapels or schools, although such facilities were clearly desirable for stated periods to enable congregations to be formed preparatory to the erection of permanent buildings. The isolation of 30ft. required for exempted buildings over 15ft. in height necessitated a larger site than was needed for permanent structures. An isolation of 10ft. or 12ft. should amply suffice to satisfy the idea of iron buildings catching fire, instead of 30ft. The model code in respect to the formation of new streets was inadequate for large towns. The minimum width of 36ft. generally followed had produced miles of streets throughout England insufficient for modern traffic, including tramways, especially where such streets were main arteries to adjoining districts. The widths had recently been increased in the Plymouth by-laws, but without reference to such streets being tributary or main thoroughfares. In hilly towns such as Plymouth the absence of a limit of gradient in the formation of new streets had allowed landowners the liberty of arranging their streets at right angles to the slope of the hill, instead of being laid obliquely to lessen the incline; and as streets, once formed, were absolutely permanent, the results to successive generations were infinitely more important than the convenience of building owners. It was to be hoped that before many years elapsed an alteration of opinion might cause fewer sewer ventilators in the main streets, especially in new estates, with further provision for proper elevated shafts. A stone wall 30in.

practicable in Plymouth to utilise the roof space in houses of ordinary span without the use of a mansard roof for the additional accommodation which could otherwise be provided at a very small first cost. Mr. Parker said that it would also be well on the score of economy for modern opening skylights to be acknowledged in by-laws. Much thought was given by borough authorities to devise workable schemes for the housing of the working classes, but little attention was given to the removal of hindrances in their own by-laws. Again, walls for an outhouse 5ft. long by 7ft. high were required to be 18in. thick for stone or 9in. for brick, by not being separately classed from main structures. The great strength and economic use of buttresses for strengthening walls was practically ignored in the schedule of wall thicknesses for warehouses and public buildings, notwithstanding the standing proofs in ancient buildings.

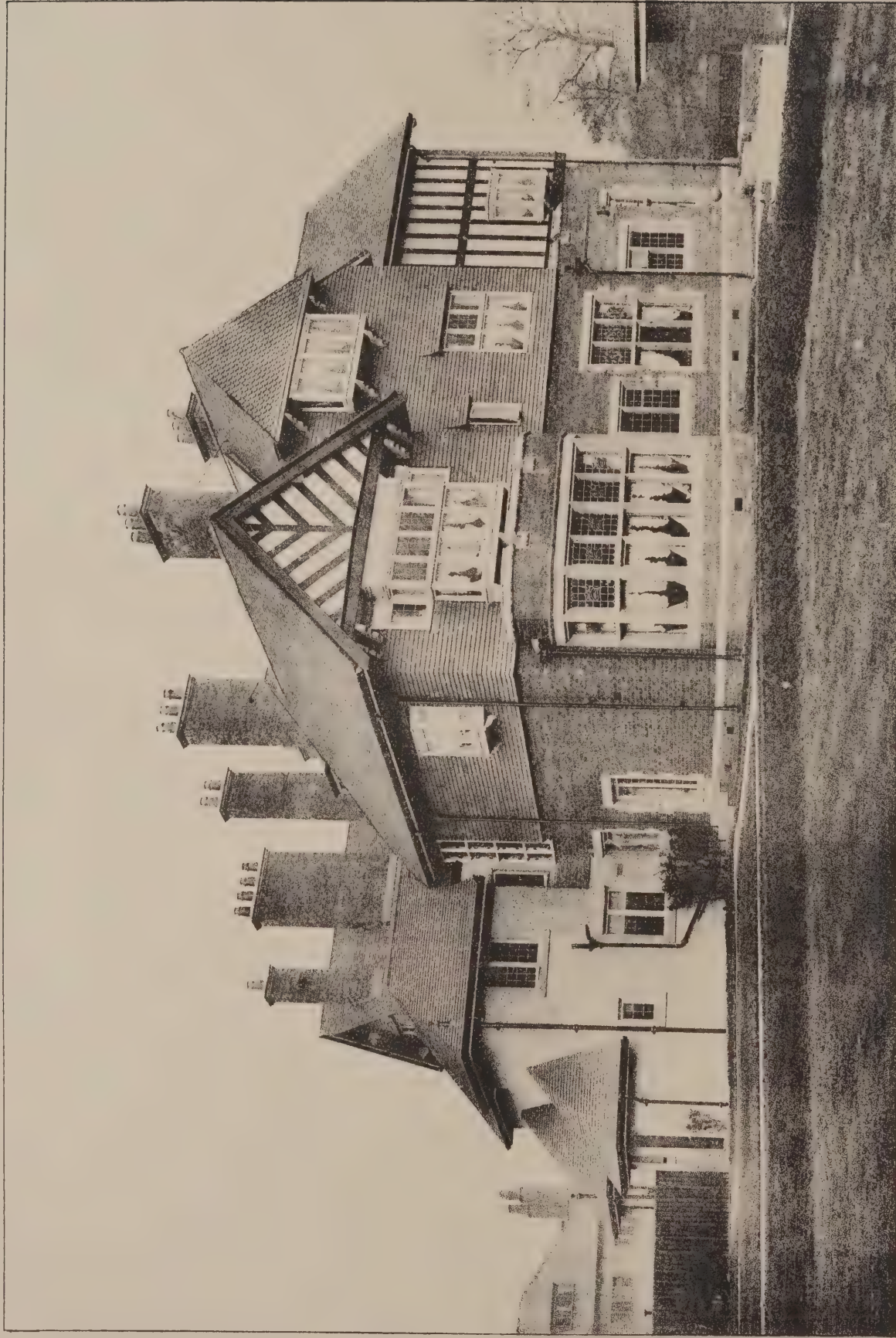
The by-laws most affecting the vital interests of the town were those relating to the requirements of open spaces at the rear of buildings. Public buildings, warehouses, factories, churches, breweries and public halls were not compulsorily required to have open spaces, the meaning of this exclusion being that they were not habitable dwellings. The requisition was applied to nominally one class of build-

ing, defined as "domestic," but, as a matter of fact, this by-law term included every other kind of building not of the public building or warehouse class. It, therefore, included numerous buildings inhabited to a much less extent than factory buildings, and quite apart from domestic use. These by-laws were not qualified in Plymouth as to the nature of use for which the building was constructed, nor for variations in districts or areas as provided in some towns, nor was there consideration given to buildings abutting on old streets formed before by laws were made, as provided for in London; nor was there any equitable rule whereby an efficient air-space could be obtained, without unduly damaging the value of the site, as full width space at the rear above the ground floor of business premises of shallow depth, such as was clearly set forth in the London Building Act. On the contrary, lock-up shops with offices over, re-erected on old sites in the very heart of the town, were required to be treated in precisely the same way as domestic dwellings in Laira or Compton, with an open yard or garden at the rear on the street level, notwithstanding that all the virtues of open space for air could be obtained over shop or ground-floor levels. The consequences were that persons owning property in the chief streets—especially where the site was not of great depth—were unable to rebuild at all without losing one-third or even one-half the ground area of their valuable premises. Consequently restoring and patching the old premises had to be resorted to instead of rebuilding.

Ancey is a peaceful old town in Savoy hemmed in on three sides by mountains which almost enclose the beautiful lake that borders it. Canals run inland from this lake, affording many picturesque street views; the streets themselves are mostly provided with stone colonnades, and on market days the country-folk arrange their wares under the arches. The two views shown on this page are typical of a small French agricultural town. An illustration of the Palais de L'Ile and some additional particulars of Ancey were published in *THE BUILDERS' JOURNAL* for May 8th, 1901.



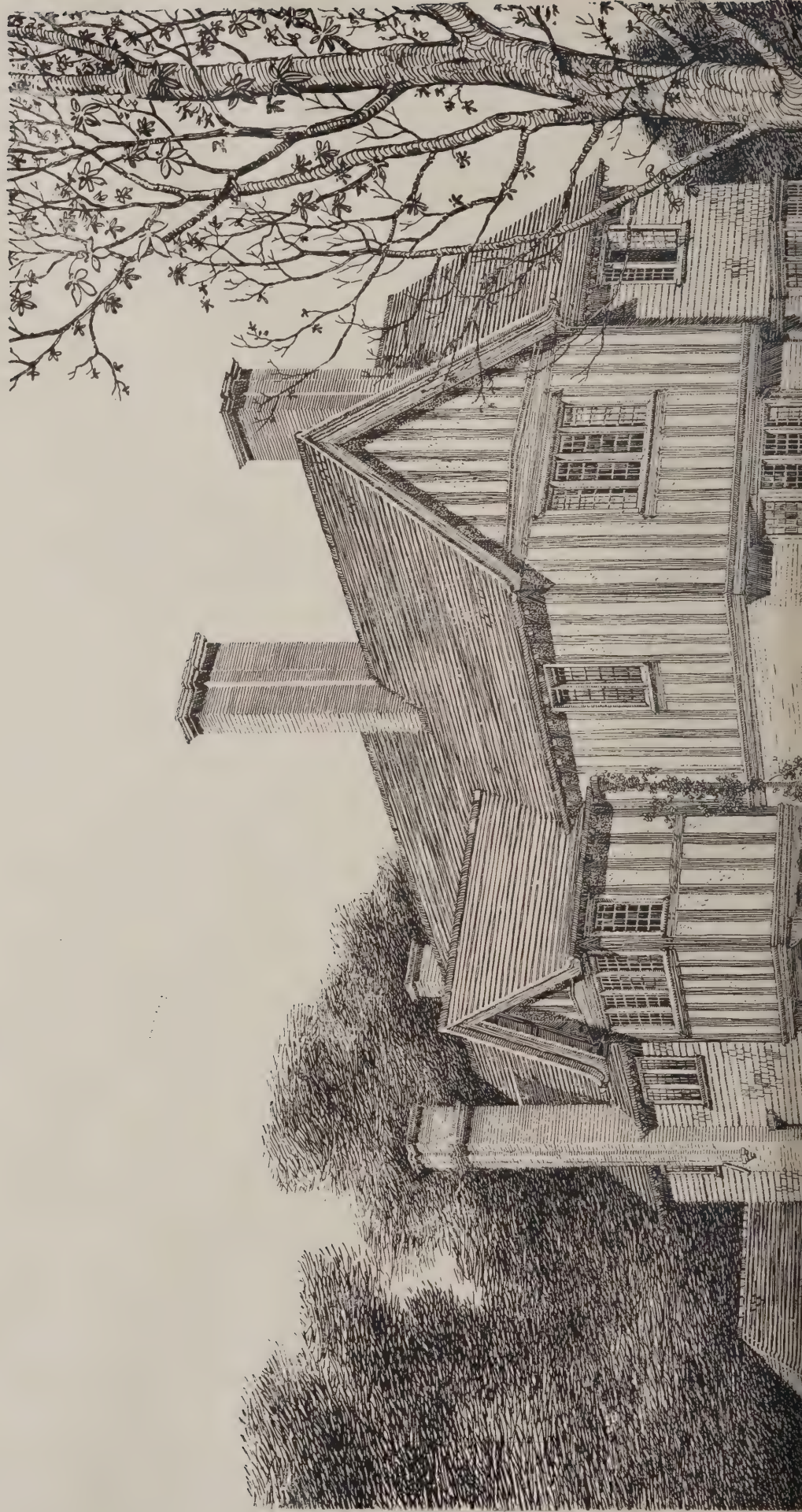
ANCEY: PORTE ST. CLAIRE.



HOUSES, NORTH HILL ROAD, HEADINGLEY, LEEDS: SOUTH-WEST FRONT.
ALBERT E. DIXON, A.R.I.B.A., Architect.
"INK-PHOTO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

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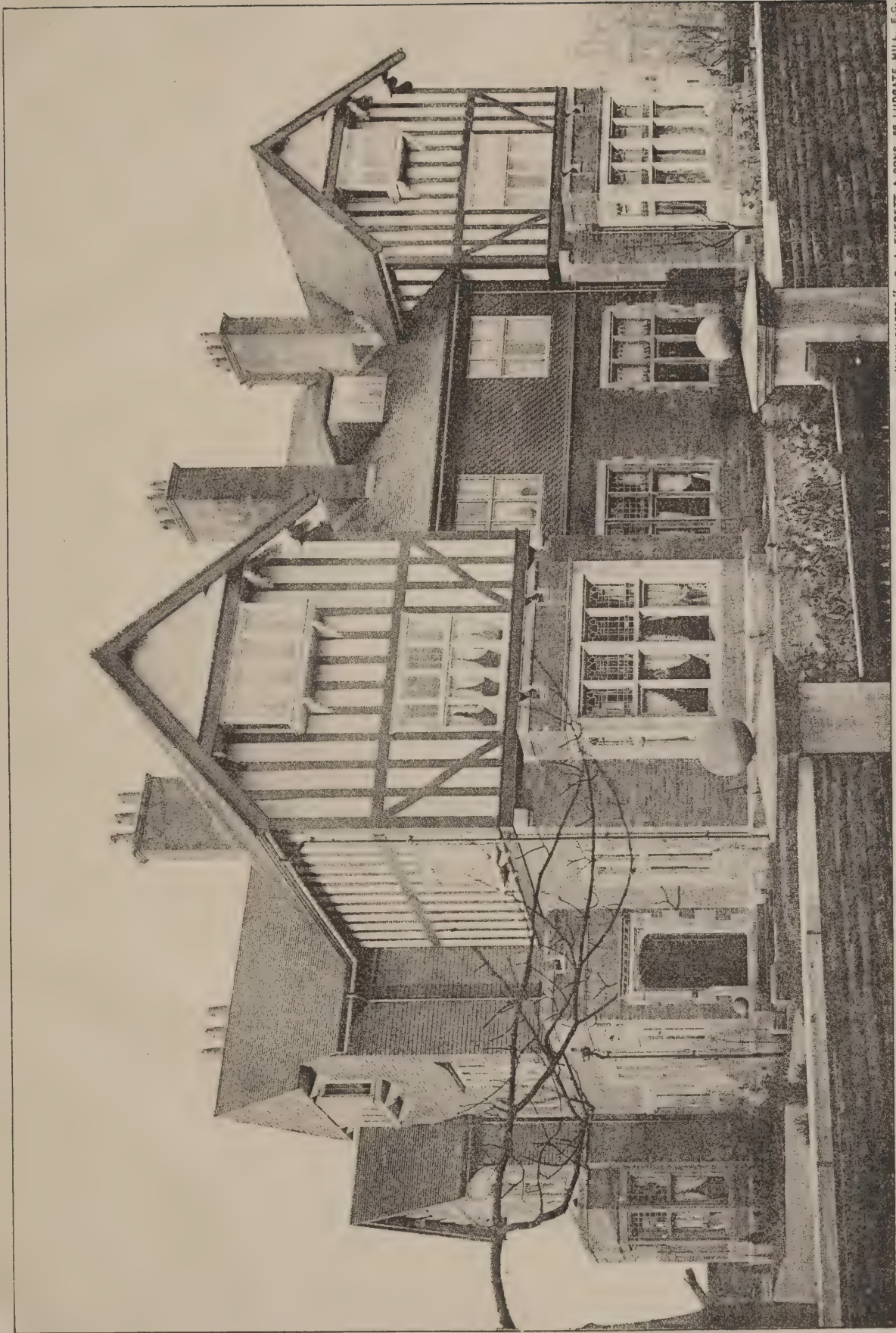
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, April 23rd, 1902.





THE ROFT, NEWARK.
for W.D. QUIBELL, ESQ.
DREWILL & DAILY, ARCHITECTS.
NOTTINGHAM. & NEWARK.

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HOUSES, NORTH HILL ROAD, HEADINGLEY, LEEDS: SOUTH-EAST FRONT.
ALBERT E. DIXON, A.R.I.B.A., Architect.

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BATTERSEA HOUSING COMPETITION.

THE Battersea Council recently invited competitive designs of houses for the working classes, consisting of five types of houses, as follows:—(1) A house of two storeys containing not more than five rooms and scullery, &c.; (2) a house consisting of two self-contained tenements containing three rooms and scullery, &c., on each floor; (3) a house consisting of two self-contained tenements containing four rooms and scullery, &c., on each floor; (4) a house consisting of three self-contained tenements containing three rooms and scullery, &c., on each floor; and (5) a house consisting of three self-contained tenements containing four rooms and scullery, &c., on each floor. The instructions were furnished to 106 persons, and fifty-eight sets of designs were submitted. On January 31st the Committee met and received these designs. They appointed Mr. Thomas Blashill, late superintending architect to the London County Council, to assist them in the matter. The Committee on several occasions conferred with Mr. Blashill, and in view of the number and class of designs submitted they were in favour of awarding four extra prizes of £10 each in addition to those of £50, £25 and £10 already agreed upon; and having obtained the authority of the Council to do so, they came to the following decisions:—(a) That the authors of design No. 37 have submitted the best set of designs, particularly as to the cottage and the four-room tenements; and the first premium of £50 is awarded to Messrs. G. T. Smith & Weald, 10, Guildford Place, London, W.C. (b) That the author of design No. 12 is the next in merit, particularly as to the three-room tenements; and the second premium of £25 is awarded to Mr. J. Sydney Bucklesby, of "Fairlawn," Kingston Road, Merton, Surrey. (c) That the author of design No. 21 is the next, particularly as to the four-room tenements; and the third premium of £10 is awarded to Mr. H. Bertram Tarrant, 27, Devereux Road, Wandsworth Common, S.W. (d) That the authors of the following designs (placed in the order of their number) be awarded the extra premiums of £10 each upon their consenting to allow the designs to become the absolute property of the Council, the condition already attached in cases (a), (b), (c):—

No. 4: Messrs. Haigh & Spencer, 19, Spencer Road, Wealdstone, Middlesex.

No. 8: Mr. W. G. Lewton, 6, "The Forbury," Reading.

No. 19: Mr. William West, 19, Craven Street, Strand, W.C.

No. 23: Mr. F. J. W. Goepel, 36, Bulwer Road, Leytonstone, Essex.

The designs are on exhibition this week at the Municipal Buildings, Lavender Hill, S.W., from 2 p.m. till 5 p.m. to-day and on Saturday, and from 2 p.m. till 9 p.m. on Thursday and Friday.

Caerwent Explorations.—Lord Llangattock, in a letter addressed to the chairman of the Newport (Mon.) Museum and Art Gallery, expresses his satisfaction at the prospect of the treasures from Caerwent being deposited at Newport. His lordship feels most strongly that they should not be taken out of the county, and has evidently considered the difficulties in the way of arranging for the proper custody of the remains at Caerwent itself. There is some probability too that the Roman remains at Caerleon will ultimately find a more fitting resting-place at Newport Museum.

Greek Antiquities.—Dr. Dörpfeld, the Director of the German Archaeological Institute at Athens, acting on his conjecture that Homer's island of Ithaca, of which Odysseus was king, was that now known as Santa Maura (Leucadia), which lies to the north of Thiaki, has been making excavations there. He believes that some of the remains he has already discovered, including objects of art and traces of monuments and aqueducts, date from the Homeric epoch and confirm his theory. The Archaeological Committee has decided to restore the Erechtheion. The greater part of the famous ruin on the Acropolis is still standing, and the fragments necessary for its complete reconstitution are all lying around.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Classic art had to portray only the finite, and its forms could be identical with the artist's idea. Romantic art had to represent, or rather to typify, the infinite and the spiritual, and therefore was compelled to have recourse to a system of traditional, or rather parabolic, symbols. Hence the mystic, enigmatical, miraculous, and transcendental character of the art-productions of the Middle Ages.—HEINRICH HEINE.

Our Plates. THE two semi-detached houses and stables in North Hill Road, Headingley, Leeds, were completed last year for Mr. J. A. Holroyd. The elevations are in red-pressed bricks, Morley stone, red-tile hanging and red-tiled roofs; portions of the exterior walls are carried out in timber and plaster. All the drains run direct to manholes or have iron inspection eyes at bends. Upon the north and east the erection has to follow a building line. In the south house the hall is panelled with kauri pine stained and polished. The drawing-room is panelled with American yellow-pine painted white and the dining-room is panelled in oak. In the north house the hall is panelled in American yellow-pine. The photographs are by Mr. Charles R. H. Pickard, of Park Lane, Leeds. The architect is Mr. Albert E. Dixon, A.R.I.B.A., of 5, Park Lane, Leeds.—"The Croft," Newark-on-Trent, has recently been erected for Mr. W. B. B. Quibell from designs by Messrs. Brawill & Bailly, architects, of Nottingham and Newark, and the work has been admirably carried out by Mr. William Smith, builder, of Newark. The house consists of a spacious panelled entrance-hall, with cloakroom and lavatories, &c., morning-room, dining-room, drawing-room, with convenient kitchen offices, all of which are on the ground floor. On the first and second floors are a billiard-room, seven bedrooms, two bathrooms, linen and box-rooms, &c. The whole of the premises have been fitted up with a self-contained electric-light plant, which has been carried out by Messrs. Furse & Co., of Nottingham. All of the rooms, halls and corridors, &c., have been heated with hot-water, which has been carried out by Messrs. Howitt & Sons, of Newark. The exterior of the house is constructed of red bricks and the upper portion of tile-hanging and half-timber, the roof being covered with red tiles.

The late Mr. Oldfield. MR. EDMUND OLDFIELD, M.A., F.S.A., Hon. Fellow of Worcester College, Oxford, died recently in his eighty-sixth year. He was in his day a considerable authority on architecture and classical archaeology. For many years he retained the honorary office of librarian of Worcester College. He became assistant keeper of antiquities at the British Museum, and was associated with Sir Charles Newton in organising and developing that department. He was the author of several papers on subjects of classical archaeology, including those on the Mausoleum of Halicarnassus. He was placed on the committee for the decoration of St. Paul's, and was a strong opponent of the designs of Mr. William Burges, which were illustrated by a model exhibited at the Royal Academy. Mr. Burges, in the early 'sixties, had carried out in the chapel of Worcester College an elaborate scheme of decoration and colour which met with Mr. Oldfield's strong disapproval, and was quoted as a warning against the employment of Mr. Burges upon St. Paul's.

Decorators and Architects. THE Incorporated Institute of British Decorators held its annual dinner last week. Mr. J. D. Grace (the president) occupied the chair. Mr. W. G. Sutherland, in proposing "The Incorporated Institute of British Decorators," said that their chief aim was to bring together decorators, and to show that they had some higher aim in view in raising the standard of their art. The chairman, in reply, said there were two questions he would like to see dealt with: first, some method of arbitration should be established which would save a great deal of misunderstanding and litigation; and, secondly, a form of contract should be devised between decorators and architects, which, while leaving

freedom to the latter, would not prove oppressive to the decorator. "The National Association of Master-Painters of England, Scotland and Ireland" was proposed by Mr. M. Cawton (past-president of the Painter Stainers' Institute). Mr. J. G. Cole replied for Wales, Mr. John Scott for Scotland and Mr. Sibthorpe for Ireland.

Truro Cathedral. THE Building Committee of the Truro Cathedral met last week for the further consideration of the report of Sir Thomas Drew on the cracks which have developed in the nave piers of the cathedral. Sir Thomas Drew, in his report, which was dated January 14th, said that he had no adverse criticism of the designer of the piers. He could not say, however, that he personally accepted the view that the modern methods of rigid and inelastic constructions, the fine jointing in laying stone, was an advance upon ancient practice. The cause of disaster obviously to him arose from the modern specification as to mortar and bedding observed with a precision which was quite unusual in less conscientious builders. Beds of piers in old work were usually laid in a comparatively thick bed of mortar, not too good, which lent itself to a certain elasticity. At Truro the mortar was to be theoretically perfect as a cohesive cement and the jointing theoretically perfect. The result was that the several drums of the columns became so perfectly adhesive that the pier became practically a monolith, with the attendant risk of undistributed pressure all coming on a single bed under the plinth. The provision of a damp course of asphalt added to the evil. Although it might be urged that as there had been no spreading of the first fracture the base stones had found their bearings and might remain, he would not take the responsibility of advising such inaction. It was possible that at some time or another some disturbance might affect the true plumb in the piers, and the least shift of pressure on the fractured bases might mean disaster. He therefore recommended that the fractured stones be taken out and replaced with sound stones of a harder kind than the Bath stone used in the original construction. The rubble foundation should be lowered to admit of a level copestone of strong concrete. The Committee resolved, in view of the fact that cracks have not increased in nine months in spite of heavy weights being placed upon them, to defer the removal of the bases of the piers. The construction of the groining will now be proceeded with.

The Latest Discoveries in the Forum. SIGNOR BONI, Director of Excavations in the Roman Forum, has found a prehistoric tomb in the bed-clay about 12ft. below the level of the Sacred Way, opposite the Regia, and close by the Temple of Antoninus and Faustina. The tomb is believed to date approximately from the eighth century B.C., and contains a large urn of black ware full of calcined bones, and several vessels. But more important architecturally is the clearance that has been made round the Temple of Castor and Pollux, the three massive fluted columns of which rival those of the Temple of Saturn as the most striking monument in the Forum. The earth and ruins having been removed, the foundations of all the east side of the temple have been laid bare in such a way as to make it possible to reconstruct the plan of the building. During the clearing many remains and fragments of the temple were discovered, the most interesting being an enormous block of marble belonging to the tympanum or spandrel of the temple on the side facing the Lacus Juturnæ. Close to this big fragment was found a capital, almost complete, the decoration of which, with that of the large fragment, will make it possible to determine the form and the richness of the decoration of the whole tympanum. It is hoped that when the earth has been entirely removed from the site of the interior of the temple some fragments will be discovered that may throw light on the internal character of the building. By a fortunate circumstance these immense marble blocks could not be taken away by the thieves of the Middle Ages and of the Renaissance, since they are firmly embedded in the tiled pavement surrounding the temple, through which they crashed as they fell from their position 100ft. above the ground.

R. I. B. A.

TRADITION IN ARCHITECTURE.

A MEETING of the Royal Institute of British Architects was held last Monday evening, Mr. William Emerson presiding. Mr. Alexander N. Paterson, M.A., read a paper on "Tradition in Architecture: its Function and Value," of which the following is a summary:—In defining the scope of his paper, while guarding against a tendency to give undue prominence to the inheritance and teaching of past times, the author sought to carry his audience with him in regard to the vital importance of tradition as an element in all art of permanence and value, in the hope mainly that the far-reaching voice of the Institute—not only within our own shores but throughout the Britains beyond the seas—might be expressed and asserted to restrain, to counteract, to check the too easily learned and pernicious teachings of the so-called "new art" movement, with certain cognate developments in English architecture. In using the term "tradition" he wished to disentangle it from another term with which it was apt to be confounded, namely, archaeology. The idea expressed by the word "tradition" in this connection was, briefly, the influence, both conscious and unconscious, upon us as workers in art to-day of the methods of seeing and doing on the part of the many generations of workers who have preceded us, and who when in life were engaged in like problems to these which now occupy us. Tradition in this sense as regards architecture was twofold, viz., tradition in construction, tradition in design. Tradition must not be confused with style. Styles have their day, and pass. Tradition endures. It must also be clearly differentiated from archaeology. The archaeologist's attitude is that of the scientist, not the artist, much less the art-worker. Defining the term "art" in relation to architecture, the author said that it was the living creative interest which devotes itself to the design and erection of buildings which will satisfy the requirements, and be in accord with the sentiments of the time; that the art in these buildings is a necessary and natural outcome and development of similar work in the past, of which the technique is learned consciously and unconsciously through tradition; and that archaeology (with history in its train) is, at best, a science by means of which we may arrive at more precise knowledge regarding certain aspects of such work. That we should be able to say that a moulding is early, late or transitional will not influence our powers of plan and design; its true importance to us is that in gaining exactness of knowledge as to such details we are bound to increase our knowledge of the work itself, of the constructional difficulties and the means by which they were overcome and rendered unexpected points of interest, of the infinite variety, the enveloping harmony and the crowning beauty of the building, which through years, and maybe centuries, of growth ultimately reached the completed, the organic form in which we see it. Only—let such enthusiasm be kept under restraint. Do not let us take it for granted that because a feature looks well in an old building therefore it will be equally effective if tacked on to a new front.

In the spirit of the old work we admire there are no qualities more pre-eminent than directness of aim and honesty of purpose. These two qualities we shall find to be most surely preserved by working after the methods of our more immediate forbears. Architecture, of all the fine arts, is most subject to convention, and that under two main influences—the one immovable, unchangeable, the limitation of that construction through which it must express itself, and which in its turn is subject to the all-pervading law of gravity; the other, as constantly but gradually changing, the physical, mental and spiritual requirements of those for whose use buildings are designed, together with the effective range of constructional resources at our disposal wherewith to satisfy these requirements. The accumulation of the tradition of former ages has provided us with certain methods, certain formulæ of construction, from which we cannot escape. On

the other hand, it is only from our immediate predecessors, and even contemporaries, that we can gather to what extent the immediate requirements of the day must guide us in our use of these formulæ, and what constructional resources are available for the purpose of extending their scope. The leading contours of mouldings and the principles regulating their use, the right and beautiful in proportion—such as these are the traditional data with which architectural design is produced; it is only when novel materials intervene, or in a particular situation, that variations, even to the extent of discords, are admissible and, in their place, admirable. Be sure, however, of the harmonies before introducing the discords. Only the master can successfully cope with the bizarre, the unexpected. There may indeed be a bondage of tradition as of archaeology, but this is impossible when (and this the author took to be an essential and vital principle in the truly traditional attitude) it is accepted in its widest form, when the tradition of yesterday and even of to-day is regarded as of not less but more importance than that of the century of Wren, of the Gothic master-builders, or of the Greek and Roman classics, when the tradition of steel girder, plate glass and electric light is accepted along with that of stone vault and flying buttress.

The author went on to speak of the present position of architecture in this country. For nearly a hundred years England has followed a path all her own in such matters, with results which can scarcely be called successful. The path has led, as it were, through a maze, and we are likely to end, when we emerge, precisely where we entered. Meanwhile neighbouring Continental nations have been quietly pursuing and developing the traditions of earlier times in the light of modern opportunities and requirements, guided therein by a continuous and systematic study of architecture, with the result that, as regards civil architecture in particular, they are far ahead of us in achievement. Few modern English buildings compare with similar work in Paris and other European centres in any of the attributes which constitute architecture a great art; yet English work of earlier date is equal, if not superior, to foreign. The moral is obvious: the fault is not the nation's or the men's, but the point of view, the methods, and, above all, the lack of continuous tradition; while, if the doctrines of the "modern school" are to prevail among our younger men, the outlook for the future is still worse. The author briefly glanced at the architectural history of England during the nineteenth century to make clear this idea. Within the last few years, however, the value of tradition, modern as well as ancient, has shown a tendency to reassert itself; architecture, along with the crafts which nourish it, has been revived, the true principles of design are being taught with organised effort, and but for this curious "new art" development there was good hope that English architecture would again assert itself in its natural and national characteristics of dignity and refinement. Of the doctrines of this "new art" or "modern school" there were various manifestations; the one prevailing tenet seemed to be that the "copying of styles" is to be avoided as a deadly sin. Why? asked the author. It was the first time in the history of architecture that a like position had been taken up, for it was surely an admitted fact that, from Assyria and Egypt onwards, the architects of Greece and of Rome, of the Romanesque, Mediæval and Renaissance times, had no other idea in their minds but, in working out constructionally their fulfilment of temporary requirements, to copy the styles which had gone before as they knew them. Did the work thus produced suffer in regard to sympathy with the needs of the times, to nobility, to beauty, even to originality thereby?

It is to this taboo of the styles that the characteristics of the new movement are to be traced. The refusal to employ the formulæ thus provided has its necessary result in the prevailing baldness, the absolute lack of variety and movement. The styles, especially those of the last few centuries, are essentially the product of civilisation; the architecture of modern times is mainly that of the city; but as recent precedents must be ignored, and architecture

cannot escape from the traditional standpoint, inspiration must be sought in the times before city life existed, with a resultant sham rusticity, an assumed simplicity of living and thinking, entirely at variance with the thoughts and habits of those whose requirements the buildings are supposed to supply and even, if due investigation were made, with those of the designers themselves.

Another characteristic, the result of the same tendency, is the attempt to return to the conditions of working of those earlier times when the individual worker was—or is now supposed to have been—his own master in the particular portion of the general work to which he devoted himself. The said individual worker is, of course, under present-day conditions unable to play the part thus allotted to him, but if he is employed not by a "firm" but by a "guild" all is right, and the utmost latitude is at once allowed to the producer in matters of furniture and ornament, with a consequent loss of homogeneity and restfulness in the general scheme. The half-trained amateur, again, too full of art enthusiasm to consent to the drudgery necessary to acquire technical skill in execution—being an "artist"—must be allowed absolute independence.

Encourage the crafts by all means, give the craftsmen every liberty within their own spheres—the architect will be aided and stimulated by their co-operation and help; but his must be the guiding and controlling mind, and his work may, and often must be, independent of their aid. Let it not be thought that it is by working only on such line as those just touched upon, as its devotees would have us believe, that one can be earnest or even original. He was inclined to believe that the love of originality for its own sake was the root of all evil in the pursuit of the fine arts. For indeed that, desirable quality though it be, is just one that will not come by "taking thought" for it, and if it be sought after this fashion the result is but a superficial affectation which is at the opposite pole from those solid and enduring qualities which are of ultimate value in the arts. But if the architect, instead of seeking originality and endeavouring to take it by force of devious paths and strange revivals, is content to follow the quiet lines of tradition, holding at the same time true to himself and the requirements and opportunities of his day, it will be found to have sought him. Future generations will see in his works the special beauties and qualities of his period just as we to-day discover them in those of our predecessors.

A discussion followed in which Messrs. G. H. Fellowes Fryne, W. C. H. Wilson, Henry T. Hare, Colonel Prendergast, E. W. Hudson and William Emerson took part.

A Lecture on "Garden Design" will be delivered by Mr. F. W. Meyer before the Devon and Exeter Architectural Society at the Athenæum, Exeter, to-morrow, April 24th, at 7.30 p.m.

Coronation Decorations.—A letter has been sent from the Royal Institute of British Architects, signed by the president, the hon. secretary and the secretary, expressing the hope that those who are concerned with the erection of triumphal arches and other decorative trophies will seek the assistance of eminent artists for their design, instead of being content with the mere commonplaces of trade furnishers.

An Enormous Block of Granite was recently removed from its natural position at John Freeman, Sons & Co.'s Tregarden Quarry, Luxulyan. The block was found to be 55ft. by 26ft. by 20ft., and weighed about 2,043 tons. To remove this mass a hole 3½ in. in diameter was drilled to a depth of 19ft. 3 in., and into it 40lbs. of powder were placed. It is very seldom that such a mass is removed practically in one block.

A New Wesleyan Chapel at Euxton has been opened. The accommodation is for 200 adults or a mixed congregation of about 240. The principal elevations are faced with Accrington bricks, relieved with Lancashire stone dressings. The chapel roof is ceiled at the collar beam with visible timbers, wrought and varnished. Mr. W. H. Dinsley, of Chorley, was the architect, and Mr. William Hampson, of Chorley, the contractor. The cost of the building, exclusive of the land, amounted to £1,300.

SICILY AND ITS ARCHITECTURAL MONUMENTS.—VI.

By F. HAMILTON JACKSON, R.B.A.

(Continued from p. 98, No. 373.)

THE railway from Girgenti to Palermo runs through broken country till past Aragona Calda, the junction for Catania. Beyond Comitini it pierces a spur of the hills and enters the valley of the Platani, by the side of which it runs till within a short distance of Rocca Palumba. The hill-town of Sutura which is passed on the way is supposed by some to have been the ancient Camicus. The Arabs gave it the name of Sotir in 860. All through this valley the hills are very beautiful in form and distant colour. The outlines are strange, and often remind one of the Spanish Montserrat or of the Dolomites. Along the line the signal houses and stations are protected from mosquitoes by verandahs with large panels which are filled with wire-gauze. Before reaching Rocca Palumba the watershed between the two seas is passed by means of several tunnels, and the line then runs down to the coast along the valley of the Fiume torto. Before reaching Termini the line from Messina comes in, and from this point runs along a beautiful coast into Palermo, known to the Greeks as Panormos—all, harbour—a term which perhaps applied rather to the district than to the city. It is generally considered that the city was one of the Phœnician settlements, and coins found there bear in Phœnician or Hebrew letters the word "Sis" or "Tsits," which means "flower." It is probable that there was a Sicanian town here first, or why should the Phœnicians, a trading people, have troubled to establish themselves in the place? The modern name comes from the Arabic "Balarm" or "Balarmuh."

Hamilcar Barca encamped for three years on the Heircte, a portion of Monte Pellegrino, from 247 B.C. to 245, watching for a chance of taking the city, which the Romans had captured in 254 B.C. The place of his camp was known till quite lately as the "fendo dei Barca" and depended on the Monastery of S. Martino. He then grew corn enough to feed his army there, and though Pellegrino looks barren enough now it was covered with underwood down to the fifteenth century. Augustus made it a colony. In 440 A.D. Genseric and his vandals besieged it, and its stout resistance probably saved Sicily, and perhaps Rome, since he had to return to Carthage unsuccessful. Belisarius captured it from the Goths in 535 A.D., slinging platforms to the tops of the masts of his ships, which were higher than the walls, from which archers and slingers rained missiles on the defenders. Palermo was taken by the Arabs in 830 A.D., who made it their capital, and it rapidly became exceedingly prosperous. It was said at that time to have had 300,000 inhabitants, a number which is nearly equalled in modern times. The Normans took it in 1072 and it remained the capital of the island. The greater part of the prominent buildings, however, are the work of the sixteenth and seventeenth centuries, when the Spanish viceroys ruled the island, and the more interesting earlier works have to be sought for here and there. Of the antique period nothing remains, and the buildings which show Moorish influence were most of them built for the Norman kings, the splendour of whose court and whose artistic leanings combined to make Palermo the most cultivated and advanced city of Europe during the period of their prosperity.

Perhaps the most remarkable building in Palermo is the Cappella Palatina, which is in the Royal Palace at the top of the city, and is profusely decorated with marble inlay and fine mosaics; generally considered the most beautiful palace chapel in the world. It was founded by King Roger the First, and a document of 1132 A.D. still extant, signed by Peter, Archbishop of Palermo, declares it a parish church, "by special desire of King Roger." The consecration did not take place, however, until 1140, when, according to a homily delivered on the occasion, it must have been nearly complete, although William the First also decorated the chapel with splendid mosaics. Many restorations have since taken place which are recorded by inscriptions. The plan is a combination of

Latin basilica and Greek cross. The nave has five bays, and at the choir arch the columns are coupled and the level of the floor rises by four steps, and three more steps approach the altar, which is in a semicircular apse. The choir enclosure is of marble, pierced toward the nave and inlaid in other places with elaborately interwoven forms composed of many small pieces of coloured marbles. The aisle walls are sheeted with marble in their lower portion and covered with mosaic above, a band of inlaid work dividing the two. The roof is most elaborately painted with arabesques, figures, and animals, which have a curiously Persian or Indian look. It is "artesonado" and has other Moorish features. All the arches are pointed and stilted; the columns and capitals appear to be antique for the most part. Outside is a portion of a portico of similar columns which is said at one time to have surrounded the chapel. On the right are a twelfth-century pulpit with marble inlays and a carved Easter candlestick of the same period, added to at a later date. The subjects of the mosaics are chiefly taken from the lives of Christ, St. Peter and St. Paul, and Old

is so characteristic of the period, and appears in La Cuba, La Favara, La Zisa, and other buildings of the Norman kings. The rest of the Royal Palace is absolutely uninteresting, but the Porta Nuova which is attached to it, though baroque, is picturesque from inside, having a well-proportioned loggia above the gate and a pyramidal roof decorated with painted tiles, a mode of decoration which Sicilian examples make one sometimes wish was possible in our climate.

A short distance to the left is the curious church of S. Giovanni degli Eremiti, founded in 1132 and incorporating what was probably a mosque in its structure. It has five domes, plastered externally and painted red. The plan shows an Egyptian cross with three apses, of which only the central one shows externally; the nave is divided in the middle by a pointed arch which affords partial support to two of the domes. On the south are the remains of the mosque divided by a row of five columns. Under the Normans the whole building was used as a burial-place for the nobility. Attached are some pleasing cloisters of rather later date, now laid out as a garden, with a pointed arcade



S. GIOVANNI DEGLI EREMITI, PALERMO.

Testament histories. Those in the choir are the most ancient and were probably executed by Greek craftsmen, since the lettering of the inscriptions is Greek. The Madonna over the high altar, and the figures of St. Joseph and St. Anna in the side apses, are of the eighteenth century; the altars themselves are rather later, and the choir stalls are modern. At the other end of the nave is the royal seat with panels of small ornamental inlays and the royal arms. The red cross appeared to be made of paper stuck on to a slab of porphyry! Several doors in the chapel are interesting. One is of wood with large nails in the Moorish fashion, one of hammered iron, and two of bronze. Outside is a trilingual inscription of 1142 recording the erection of a water clock.

The palace occupies the site of the ancient castle. The nucleus is Saracenic, but additions were made to it directly after the Norman conquest and by later sovereigns. Of this work, however, the only portion now apparent is the tower of Santa Ninfa, which contains the Royal observatory and the "Stanze di Ruggiero," a room decorated with mosaic and marble, said to have been chosen by Roger as his own after the siege, with another adjoining, the details of which the guardians date with the most appalling inaccuracy! The tower is ornamented externally with the flat-pointed arcading which

and coupled columns. Some have considered this as a survival of the monastery of S. Ermete, one of the six founded by Gregory the Great in Sicily; but the present name is sufficiently explained by the fact that the monks whom Roger established there were of the order of hermits founded by S. William of Vercelli and Giovanni da Musco. Other churches of the same period are La Martorana, S. Cataldo and S. Giovanni dei Lebbrosi. The last is the earliest church near Palermo, having been built in 1071, while the siege was still in progress. It is called "dei Lebbrosi" because the lazaretto was afterwards established there by William the Good. The approach is through a tanyard and a garden, for the church lies back from the road. It has the usual dome over the crossing; the roofs are vaulted with a barrel vault and finished above with concrete and tiles set as a slightly sloping terrace. The entrance is between two low towers, one of which is occupied by a staircase which leads to the roof and to the custodian's rooms, for he lives in the fabric.

The two churches of La Martorana and S. Cataldo stand close together behind the Piazza Pretoria. San Cataldo was for some time used as the post-office, but has now been cleaned out and restored in a discreet manner. It is most interesting as showing the construction of

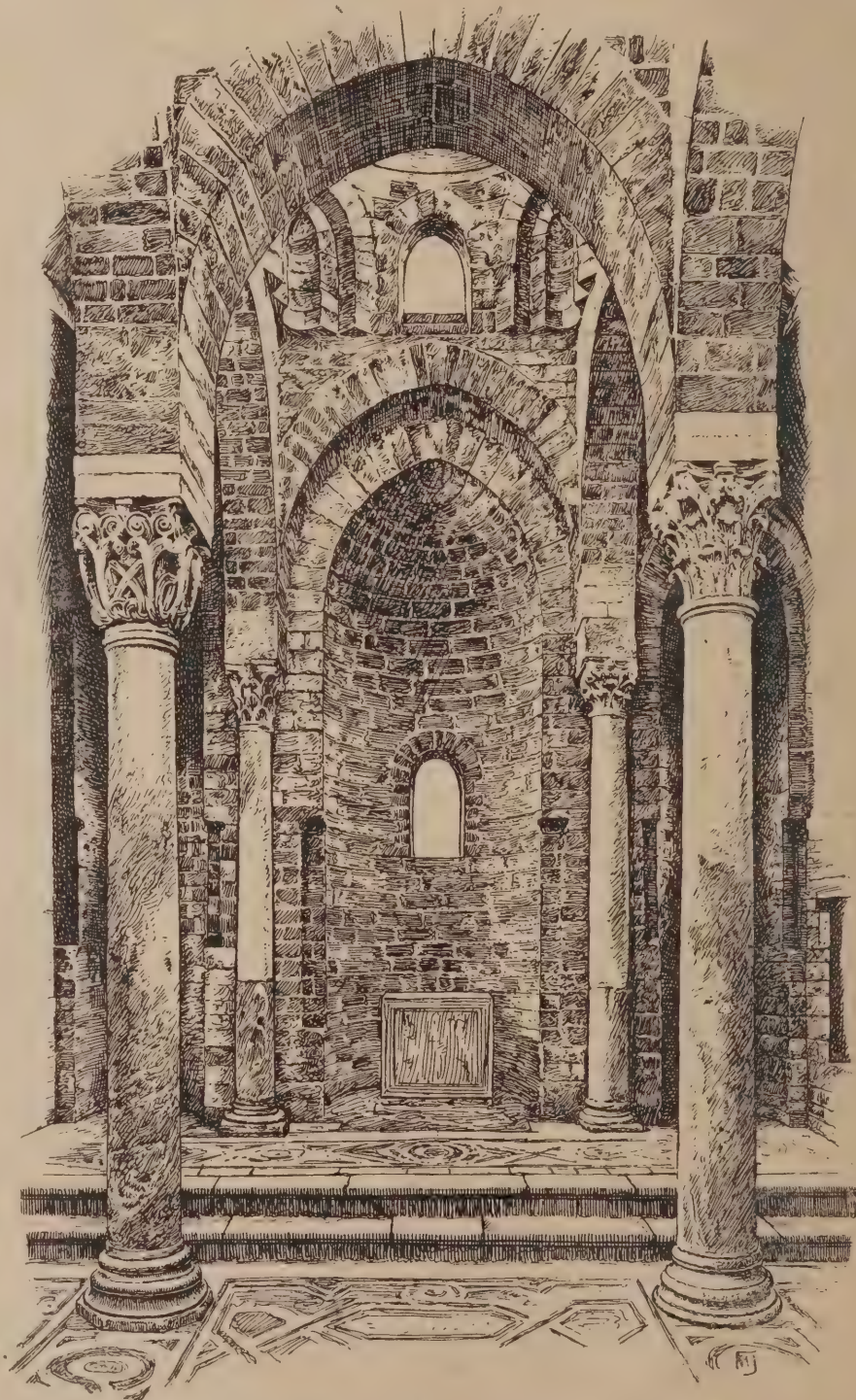
buildings of the type, since the walls are bare of mosaic or marble incrustation. It was probably founded about 1161 by Majone di Bari, grand admiral of the kingdom under William the Bad, a man of whom Falcando tells the most shocking stories, though his information has been proved false in one or two instances. What is certain is that he was murdered in the Via Coperta and that his prospective son-in-law, Matteo Bonello, was the first to plunge a sword into his side. The remains of the sword may still be seen hung at the door of the archiepiscopal palace. The populace dragged his corpse about the city in jest, Falcando says, who evidently hated him as much as the people must have done. The pavement of S. Cataldo is of the usual Opus Alexandrinum kind, and the altar front is of semi-transparent marble, with incised emblems. The Spaniards removed the mosaics in the seventeenth century, replacing them with stucco, now in their turn removed. La Martorana is so called because in 1433 it was given to the Benedictine nuns, whose convent close by was founded in 1195 by Aloisa, wife of Godfrey of Martorana, but it was founded by George of Antioch, admiral to King Roger the First in 1143, and was then called S. Maria dell' Ammiraglio. As might be expected from its parentage, it is a typical Greek church in plan, exactly like others which may be seen at Athens or Constantinople. It is square, with three Eastern apses, the dome supported on arches which spring from four columns as at S. Cataldo, and the other arches supporting the vaults arranged in the same manner. Against the triumphal arch of the apse are four colonnettes of porphyry and granite, and others in a similar position to the smaller apses; in front of them the pavement is raised. There is a door to the north and another to the south, and no doubt there was one also to the west from the atrium which was in front of the church, and where the judges of the city sat, and a notary, by name Enrico di Martino, exercised his profession. In 1588 the church was lengthened to the west, taking in the atrium and the portico. At this time the external mosaics were destroyed, except two showing King Roger before Christ and George of Antioch before the Virgin, which still remain inside, together with those of the ancient interior which cover the vaults and the upper part of the walls as in the Cappella Palatina. As there were not quite enough columns in the atrium for the fresh requirements, some were bought, and the registry notes the buying of two for 6 "onze" from the rectors of S. Antonio, and of three (two of marble and one of granite) for 38 "onze" from the Confraternity of S. Catherine of Olivella, with bases and capitals. (The granite one was cut up into four to heighten the others.) In the course of restoration fragments of plaster window-panels were found, proving, together with one found *in situ* at S. Giovanni degli Eremiti, that this was the usual manner of filling the windows at that time. After the Sicilian vespers, in 1282, the parliament met in this church to receive the ambassadors of Peter of Aragon and to swear fealty to him. The high altar, though baroque in design, is beautiful by reason of the exquisite colour of the precious Sicilian marbles of which it is constructed. The upper storey of the campanile and the cupola were damaged by an earthquake and taken down in 1726. Mongitore says that Fra Giacomo Amato, a worthy architect, "cried with grief" over it, saying that the damaged foundations ought to have been looked to, not the top of the building. It has a pointed arched entrance on the ground, and the first floor is decorated with inlays and the curious transverse rustication often found round the arches of the period.

Another ancient church very much altered in later times is the church of La Magione, founded in 1150 by Matteo Ajello, admiral to Roger the Second. It was at first held by the Cistercians, but Henry the Sixth expelled them because they favoured Tancred, and placed Germans there instead. It was at one time superior to the cathedral in riches and in the extent of its jurisdiction, and S. Giovanni dei Lebbrosi was under it. Works of restoration have revealed the existence of a painted roof, apparently of the fourteenth century, and some frescoes in the cloister. All these churches are of the kind of which the Normans found remains when they came to Sicily. The principal divisions internally

were the solea which divided the sacrarium and presbyterium from the nave or aisles by a low wall, a compartment on the north called *matroneum* for women, the men being on the other side in a space called the *senatorium*, and the three apses, the two side ones of which were called *diatonicon* and *protasis*, and were used for the sacred preparations. The exterior narthex divided the nave from the portico, an intermediate space for catechumens. The Normans found at Palermo a Greek archbishop, Greek priests at Troina, and six or seven monasteries in different parts of the island.

The ancient cathedral of Palermo was used as a mosque by the Saracens, and though restored and richly endowed by Count Roger it was not thought magnificent enough. King Roger therefore added S. Maria Inconcrinata, a chapel dedicated on May 15th, 1129, where he was crowned two years later. Here also the two Williams, the unfortunate Tancred, Henry the Sixth, Frederick the Second, Manfred of Suabia, Peter of Aragon, and all the Aragonese down to Martin, were crowned. After 1410 the kings of Sicily were crowned in Spain. Close to the chapel

was a loggia in which the king showed himself to the people, some remains of which are still to be seen in the Via del Papireto. The chapel itself was unfortunately destroyed in the bombardment of 1860. The cathedral, a building quite southern in appearance owes its erection to an Englishman, Walter of the Mill, who was archbishop under the two Williams. An inscription formerly existed in the apse which gave the date of the dedication of the cathedral to the Virgin of the Assumption as 1185. Two slender towers flank the apse, and two more very similar rise at the angles of the western façade. Three doors are in this façade: above the centre one is a very rich two-light Gothic window, while above the side doors are large windows divided into lights with slender columns. This façade is of the early part of the fourteenth century. The bell tower, similar in style, is on the other side of the street, forming part of the archbishop's palace, which is united to the cathedral by two large arches thrown across the Via Matteo Bonello. The south porch has a large central arch and two smaller arches at the sides; the gable above has



S. CATALDO, PALERMO. DRAWN BY F. HAMILTON JACKSON, R.B.A.

sunk panelling of elaborate Gothic design: it was added in 1450. The door within, with the mosaic panel of the Virgin and Child, is a little earlier. One of the columns here bears a Cufic inscription, and, no doubt, came from the old cathedral. Round the top of the walls runs a fanciful battlemented cresting, and the eastern end has inlaid arcading, something like that at Monreale. The exterior has many curious inconsistencies; for instance, pointed arched panels with mouldings enriched with the egg and dart, Greek honeysuckle forms inlaid above a corbelling the arches upon which are pointed and filled in with Renaissance shell forms, and, on the north side, a colonnade with an arch in the centre beneath a broken pediment the architrave of the door beneath which after passing the corner suddenly shoots up into a pointed arch, terminating in a scrolled keystone of late Renaissance type.

The interior was ruined by Ferdinand the First of Bourbon, the works occupying thirteen years and being completed in 1801. Ferdinand Fuga was the instrument. Ships were laden with porphyry, granite, jasper and lapis-lazuli torn from walls and pavement and sold over sea. The *chefs d'œuvre* of the Sicilian school disappeared or were destroyed and the sepulchral slabs and monuments broken up. The only remains of the ancient splendour are the sepulchres of the kings in the first two chapels to the right of the nave. Of these, four consist of porphyry tombs under canopies and two are of marble—one that of Constance of Aragon, an antique sarcophagus with hunting scenes, and the other that of Duke William, son of Frederick the Second of Aragon. The slabs with crouching figures which support King Roger's tomb show the height of Sicilian sculpture in the latter half of the twelfth century. The tomb is of simple form and made of slabs of porphyry cemented together. Those of Henry the Sixth and Frederick the Second came from Cefalù, where they were probably provided by Roger for himself and his wife. He died in Palermo, and was buried there in spite of the protests of the bishops and canons of Cefalù. Frederick the Second's is sustained by four great lions of porphyry seated on their haunches; on the cover are six circles carved with the figures of the Saviour, the Virgin and the Evangelists with their symbols. The columns and roof of the canopy are all of porphyry. Henry the Sixth's is similar, but the cover of the sarcophagus is smooth and it is not supported on lions but on slabs elegantly shaped. That of Constance, his wife, is later in date: its canopy is of marble and the columns have insertions of mosaic like those of King Roger's canopy. These tombs were originally near the chapel of the Sacrament, but in 1781 they had to be moved, and were then opened. Frederick the Second was well preserved. He was wrapped in a mantle embroidered with Arabic letters and designs; the crown sceptre and orb were laid beside him. Henry the Sixth was wrapped in a robe of yellow silk, with the imperial mitre with Arabic inscriptions at his feet. The sepulchres of King Roger and his daughter had been already rifled of everything valuable. A holy-water basin and reliefs of the Passion of Christ by one of the Gagini, and the stalls of the choir, are other noticeable things remaining in the cathedral. To the right of the choir is the chapel of S. Rosalia, the tutelary saint of Palermo, whose grotto is on Monte Pellegrino. Her shrine, which is carried through the streets in July, is heavy and extravagant in design, and weighs over 1,400lbs. of silver. The crypt beneath the choir is thought by some to be the most ancient church in Palermo. It is square, with eight columns of granite in the middle, but may have been larger before the present cathedral was founded. The arches are very strong and are pointed now, though the capitals suggest Lombard carving. Twenty-four archbishops lie buried in it, some of them in early Christian sarcophagi.

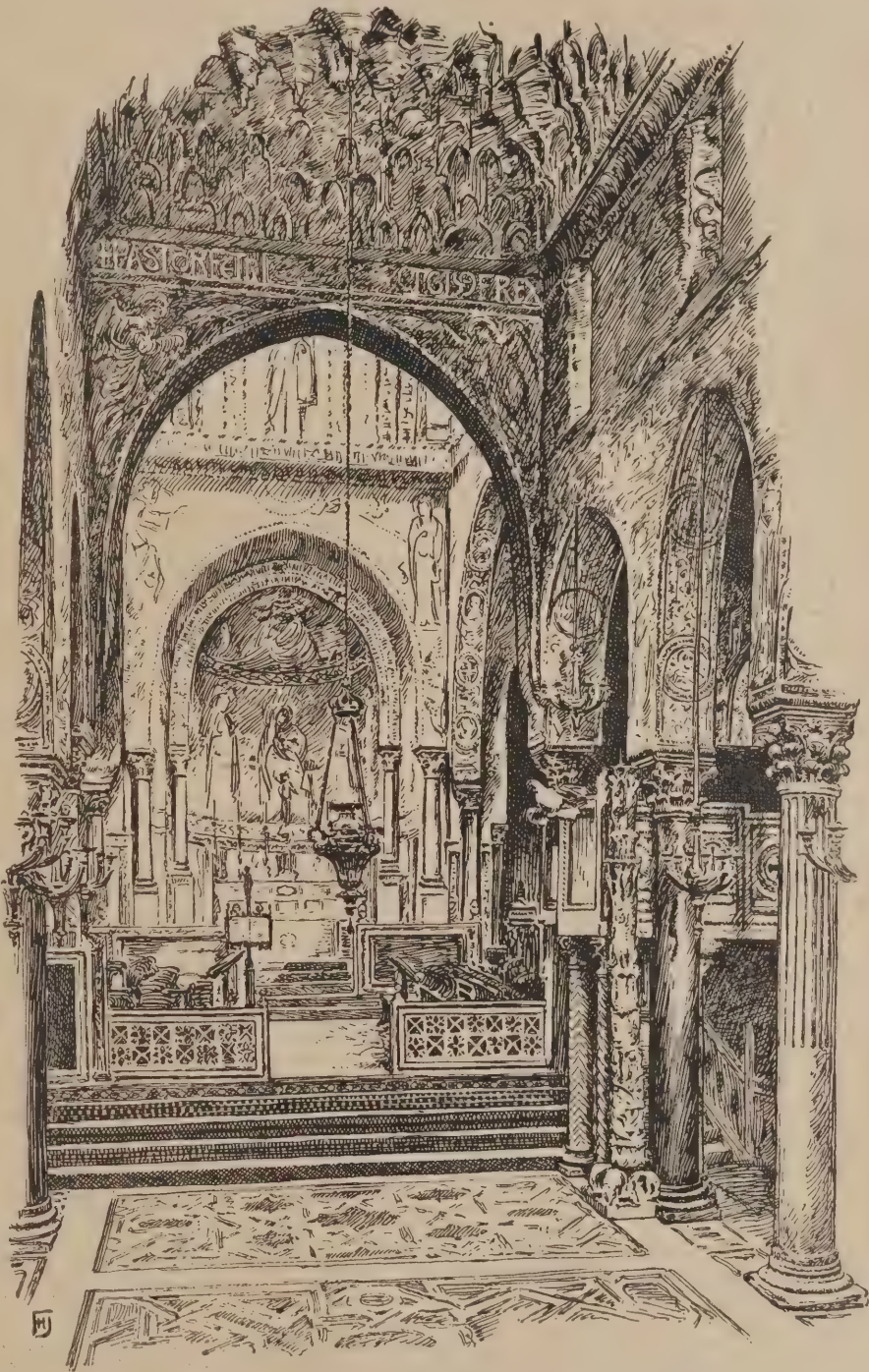
(To be continued.)

NOTICE.—We have made arrangements for the publication of concise answers to the questions set in the South Kensington Building Construction examinations which will be held on Saturday evening, May 3rd: and we hope to publish the answers to questions set in the Elementary Stage in our issue for the following Wednesday, May 7th.

FIRE TESTS WITH AUSTRALIAN HARDWOOD DOORS.

THE British Fire Prevention Committee has just issued Nos. 68 and 70 of its publications, dealing with fire tests with jarrah and karri doors. The former test was with a 1½in. framed jarrah door with 1½in. solid panels and a similar door of karri. The door openings were

test with a 2in. jarrah four-panel (bead flush both sides) door and a similar door of karri. The doors were of the same size and similarly hung as those in the previous test. The temperature averaged about 2,000 degs. Fahr. The following is a summary of the effect:—In 5 minutes smoke appeared over the top right-hand corner of the karri door and through the panel near the hanging stile; in 20 minutes smoke appeared at two points in the right-hand



CAPPELLA PALATINA, PALERMO. DRAWN BY F. HAMILTON JACKSON, R.B.A.

3ft. by 6ft. 9in., the doors opening inwards on the fire side. The following is a summary of the test, which lasted one hour:—In 1 minute smoke came through the joints of both doors; in 13 minutes flame appeared over the top of the karri door, and in 16 minutes flame similarly appeared over the top of the jarrah door; in 48 minutes the top rails of both doors were alight all along; in 53 minutes small holes were burnt through the karri door about the centre and bottom rails; in 57 minutes flame was extending downwards through the joints between the stiles and the upper parts of the frames of both doors; in 58 minutes small holes were burnt through the jarrah door about the centre rail.—Publication No. 70 deals with a

panel of the jarrah door, and in 26 minutes vapour appeared at the bottom of the lower left-hand panel of this door; in 28 minutes vapour appeared at two points through the joints of the lock rail of the karri door, and in 30 minutes both of the top panels of this door buckled inwards; in 30 minutes also vapour appeared at the lower bolt of the jarrah door; 5 minutes later a red glow appeared in the left top panel of the karri door and the lower left-hand panel was bulging slightly inwards; in 39 minutes the upper panels of this door buckled inwards and a red glow appeared in the joint between the hanging stile and the lock rail; in 46 minutes flame appeared at the top of the muntin of this door; in 50 minutes the top of the jarrah

door was bulging outwards; in 52 minutes a glow appeared between the slamming stile and the lock rail of the karri door, and also at the top left-hand corner of the lower panel and between the panel and the bottom rail; in 53 minutes the lower panels and muntin of this door were bulging outwards, and after the same time the jarrah door was bulging outwards at the slamming stile next the lock rail; in 56 minutes a red glow appeared in the slamming stile of the jarrah door about 6in. above the lock rail; in 60 minutes flame appeared over the top bolt of this door, and in 60 minutes also the muntin and upper panels of the karri door had fallen. At the close of the test the jarrah door was still standing, the slamming stile burnt through in two places, much bulged, and the joints of the panels next to the slamming stile open; while the door and frame of the karri door were practically destroyed.

AUSTRALIAN TIMBER BRIDGES.

AT a recent meeting of the Society of Engineers a paper was read on "Australian Timber Bridges and the Woods used in their Construction" by Mr. Herbert E. Bellamy, city engineer, Rockhampton, Queensland. At the outset he pointed out that bridges built entirely of timber were now seldom erected in England, but in the Colonies such bridges were very extensively employed. He then proceeded to discuss the life of such bridges, which, he said, was very varied, but might be put at from thirty-five to fifty-five years, according to situation and other circumstances. He then proceeded to describe a timber bridge which he had recently designed and erected in Queensland. This bridge is 320ft. long and 18ft. 6in. wide. It spans a creek 10ft. deep at high water, and which also has 20ft. of black mud below the bed. In flood times the waters rise 25ft. above the level of the ordinary high-water mark. The piles, which are of ironbark timber well creosoted, were described in detail, the sizes, lengths, methods of scarfing, driving, tests and covering with Muntz's metal being given. The cost of driving the piles complete, including materials, labour, plant, &c., was given at 4s. 6d. per lineal foot. The decking and its members are of spotted gum, and the cost was stated to be 99s. per square, including all material and labour. The total weight of all the timber in the bridge as fixed is about 200 tons, whilst the work of the ironwork fixed is 4½ tons. The total cost of the structure, including a small portion of the approach roadway, was £1,900. Mr. Bellamy then described the different varieties of Australian timbers—seventeen in number—mostly used in bridge-building and for other constructive purposes, specimens of all of which were exhibited. He referred to the distribution in the Colonies and the qualities, &c., of the principal trees. Of different kinds of timber suitable for bridges, ironbark, spotted gum, blue gum, blood-wood, blackbutt, box, mahogany, karri and swamp mahogany were stated to be amongst the most durable. Ironbark, mahogany, blue gum, blood-wood, swamp mahogany, turpentine or peppermint, tea, she-pine and cyprus pine are very durable when constantly immersed in water or in wet ground, and are therefore well adapted for piles, &c., for the foundations. Karri, which is a member of the eucalyptus family, is largely used for street-paving. Mr. Bellamy expressed the opinion that the good qualities of Australian timbers were not fully realised, otherwise they would be more extensively used both in Europe and America. He next described in detail the appearance of good timber, the chief qualification being slowness of growth as shown by the narrowness of the annual rings. He then enumerated the various methods of seasoning, which consist either in evaporating the sap by air-drying or in dissolving it in water and afterwards sun-drying the timber. Artificial drying is rarely resorted to with timber for engineering purposes. He then passed on to a consideration of the general causes of decay and the destruction of timber by worms and insects. The destructive methods adopted by the white ant and the *teredo navalis* for invading timber were explained, and the means employed for its protection against these pests were pointed out. It

was stated that copper sheathing was not permanently effectual in resisting the attacks of the *teredo*, but that creosoting, properly carried out, was the most successful of any process yet known. The preservation of timber was then considered, and the lecturer dealt with painting, charring, creosoting and impregnation with metallic salts. The last method, however, has not in all cases given satisfactory results.

Builders' Notes.

Mr. Samuel Manson, builder and contractor, of Scarborough, died recently at the age of sixty-six years.

Preston Builder's Affairs.—The public examination was recently held of James Varley, builder, of Preston. The statement of affairs showed gross liabilities £4,883 1s. 6d.; expected to rank, £724 1s. 6d. The examination was adjourned till May 9th.

The Adelaide Gallery Restaurant has been partly refloored by the Acme Wool Flooring Co. on the system patented by Mr. W. W. Duffy. East India teak and West Australian jarrah blocks are used, laid in herring-bone pattern on the ordinary boarded floor.

A Big Timber Yard Fire occurred last Saturday at Gainsborough, Lincolnshire, on the premises of Messrs. Newsum, Sons & Co., timber importers, who have extensive mills and warehouses adjoining the river Trent. An immense stock of planed and moulded work and prepared builders' materials was destroyed. Nothing was saved and the damage is estimated at nearly £100,000.

A SPEECH BY MR. EMERSON.

THE Cardiff, South Wales and Monmouthshire Architects' Society held its annual dinner at Cardiff recently. Mr. E. W. M. Corbett presided.

Mr. E. Seward in proposing the toast of "The Royal Institute of British Architects" coupled it with the name of its president, Mr. William Emerson, and referred to the unique position occupied by Mr. Emerson, who, with a true love of the romantic side of Gothic building, wove into its feeling the real spirit of the Oriental art. That was a complex sort of problem for an architect to attempt. In that respect Mr. Emerson stood alone. He had also taken a prominent part in such public matters as the Victoria Memorial Executive, of which he was a member. Mr. Emerson had lately returned from India at the request of Lord Curzon to consult regarding the Queen Victoria memorial for India.

Mr. William Emerson, in reply said it was a very real pleasure to him to be present, not only because he had come to meet the architects of South Wales, but also because some of his earliest interests in architectural matters had been aroused by objects in this district while he was a pupil of the late Mr. William Burges. The Royal Institute of British Architects had now about 1,800 members, and with allied societies it had about 3,000 or 4,000 members. The end and aim of the Institute were to promote the advancement of the art of architecture and to look after the interests of the profession. So far as the first aim was concerned he supposed that one of the principal ways in which to do this was the education not only of the public but the rising generation of their own profession. In the latter respect England was behind France, Austria, Italy and other European nations. But England had made decided strides, and this had been mainly the result of increased interest taken by the Institute in examinations. He was glad to know that this had had a popularising effect on them, and it was gratifying to find that last year no fewer than 670 sat for these examinations—a larger number than ever before. The architects of this country did not need anything in the shape of a diploma granted by Act of Parliament, but if these examinations were properly arranged matters would right themselves in time. Another point that he would like to say a word about was the want of *esprit de corps* among architects. The speaker deplored the way in which competitions were often started

by public bodies. They caused a tremendous amount of waste of time and energy among members of the profession. Competition was of course a good thing in some ways, but when it came to rushing into every single competition he thought that architects should make a stand against them unless every man was paid so much for his drawings, and some duly qualified assessor appointed. In reference to the rush of work nowadays he urged that more time was wanted to enable the architect to go more into the country in order to allow him to study the lessons which were to be learned from Nature, because a man with a true love of the beautiful would no more sit down and design some of the buildings that were to be seen in the streets of to-day than he would design a warehouse and call it a palace.

Keystones.

The Estate of the late Mr. Sidney Cooper, R.A., has been proved at £40,659.

Mr. William Jones, architect, of Morgantown, Merthyr, a nephew of the late Mr. John Williams, whose business he took over, died recently.

All Saints', Weston-Super-Mare.—The completed portion—chancel, nave and north aisle—of the permanent church of All Saints', Weston-super-Mare, has been consecrated. The foundation-stone was laid four years ago.

The Grove Park Workhouse, which was recently handed over to the Greenwich Board of Guardians by the contractor (Mr. Thomas Rowbotham), has cost £175,020, or £240 per bed, while that of a neighbouring workhouse of practically identical extent has been £257 per bed. Mr. Thomas Dinwiddy is the architect.

Stourhead House, a fine old Georgian mansion dating from 1720, the residence of Sir Henry Hoare, Bart., at Stourton, Wiltshire, has been destroyed by fire. The outbreak was due to a defective flue in a bedroom. The valuable pictures and heirlooms, of which the mansion contained a great store, were removed in safety, but the building was gutted.

Charles Kean's Scenery.—About 400 water-colour drawings, about 10in. by 7in., of the scenes and properties in the plays produced by Charles Kean at the Princess's Theatre are now to be seen in the Victoria and Albert Museum, South Kensington; and among them are many interesting architectural schemes. They have been presented to the nation by Mr. and Mrs. F. M. Paget, into whose possession they had come, Mrs. Paget being a niece of Mrs. Kean.

The Church Crafts League will hold an exhibition of the work of its artist members at the Church House, Westminster, S.W., from April 30th to May 30th, between the hours of 10 a.m. and 6 p.m. Admission is free and no tickets will be required. The collection of mediæval church ornaments which Mr. W. H. St. John Hope obtained for the "English Church Exhibition" at Brighton during the Church Congress in October last will also be included in the exhibition. The "private view" will be on Tuesday, April 29th, and the Lord Bishop of Rochester will formally open the exhibition on that day at 4.30 p.m. Cards of admission (for April 29th) can be obtained from the secretary, Mr. Francis Burgess, Church House, Westminster, S.W.

Manchester Society of Architects.—The report of the Council for the year 1901-2 gives the aggregate membership as 193 (an increase of eleven during the year). Reference is made to the Badge of Office which has been presented to the Society by Mr. Alfred Darbyshire, to be worn by the president for the time being. With regard to the proposal to create a Chair of Architecture at Owens College, the Council state that no effort will be spared by them to further this desirable object. The Competitions Committee report that they have formulated a scheme for appointing correspondents in various towns within the Society's area, as defined by the R.I.B.A., so that they can be informed early of any proposed competitions and get into communication with the promoters. The revenue account shows a deficit of £31 7s.

The Last of Fotheringhay Castle.—Lady Wantage has given the Peterborough Archaeological Society permission to protect the last remnant—a fairly large but shapeless piece of dressed stone and concrete—of Fotheringhay Castle, Northamptonshire, where Mary Queen of Scots was beheaded. The castle was dismantled in 1630.

Turner's House at Twickenham is to be offered for sale by auction to-morrow. Sandycombe Lodge, as the house is called) though Turner himself first named it Solus Lodge), is within three minutes' walk of St. Margaret's Station, and, it has been said, was built from his own design. This, however, seems doubtful, and even the period of his residence there is matter for conjecture. Some date it from 1814 to 1826, but Ruskin believed it was from 1808 until 1827. Turner learnt much of his art at Twickenham. He kept a boat and spent long days on the river, sketching and studying the water surface, colour and reflections, the changing cloud-forms, and the morning and evening mists.

Liverpool Architectural Society (Incorporated).—The annual report of the Council for the fifty-fourth session was presented to the first annual general meeting of this Society held on Saturday last. The Council drew attention to the fact that the past session marked the long-delayed incorporation of the Society. Unfortunately several of the older members, whose interest in the Society has for some years been dormant, regarded the incorporation as an opportunity to resign; so that the membership has slightly decreased. Reference is made in the report to the revived proposal to provide Liverpool with a cathedral, but the facts have already been published in these columns. The treasurer's account shows a balance in hand of £30 14s. 8½d.

The Tower of Cuenca Cathedral, Spain, collapsed last week. Three houses adjoining the cathedral and a large part of the cloisters were overwhelmed. The damage done is very great, and the whole cathedral threatens to fall. It appears that the dangerous condition of the cathedral tower was recognised so long ago as 1888, when a grant of 100,000 pesetas was solicited from the Government for its repair. The money was not forthcoming, and no adequate measures have since been taken to ensure the safety of the tower. As a matter of fact the burden of repairs should properly fall upon the municipality, but it is a duty which can hardly be efficiently performed by the *ayuntamientos* of small and impoverished towns, and it would be well if, in their case, the Government could come to their aid.

The Holborn to Strand Street.—The old hostelry known as Carr's, situated in the Strand at the extreme east corner of the new street, has been pulled down. It will be rebuilt on much more extensive and elaborate lines, extending eastwards to the Law Courts at the corner of Clement's Inn. The elevation, which was the first one to be approved by the London County Council, is Classic in design. The ground-floor storey up to and including the cornice will be of granite, and the upper portion of Portland stone. Contained in the block beyond the restaurant there will be three shops, and in the upper portion of the premises suites of offices. The total frontage to the Strand is 104ft. The architect is Mr. Walter Emden, 105, Strand, W.C. The general contractors are Messrs. Holliday & Greenwood, Loughborough Junction. The steel construction is by Messrs. H. Young & Co.

The Architectural Association of Ireland held its annual dinner last Saturday week at Dublin. Mr. C. J. McCarthy, city architect, presided. The chairman proposed the toast of "Our Guests," coupling with it the names of Mr. J. Rawson Carroll (vice-president R.I.A.I.), Mr. James P. Pile (Master-Builders' Association) and Mr. George Coffey. Mr. Pile referred to certain importations in the shape of architects and builders that had recently visited Dublin, and mentioned that lately three large Dublin contracts had been given to architects resident in other cities. He believed that the work could have been done as satisfactorily by men belonging to their own city. Mr. J. Rawson Carroll proposed the toast of the "Architectural Association." The chairman said that though the society had been only six years in existence it had had a very fair measure of success, and had done much for the advancement of the profession.

Working-Class Houses at Whitley Upper, Huddersfield, are proposed to be erected by the U.D.C. at an estimated cost of £1,240. Mr. Joseph Berry, architect, of Huddersfield, has prepared the plans. A Local Government Board enquiry was held last week.

Dairy and Flats, Great Marylebone Street, London, W.—The architects of this building (illustrated on p. 127 of our last issue) are Mr. George Harvey, A.R.I.B.A., and Mr. Henry A. Saul, 5, John Street, Bedford Row, W.C.; not "Saul & Hardy," as previously stated.

Change of Address.—Mr. Delissa Joseph F.R.I.B.A., architect, has removed from 17 and 18, Basinghall Street, to larger offices, with access by lift, at Portland House, Basinghall Street, E.C. The telephone No. 1138, London Wall, and the telegraphic address, "Rebuilding, London," will remain unchanged.

Northern Architectural Association.—The annual report for 1901-02 gives the present membership as 211. The statement of accounts shows a balance of £38 19s. 9d. cash in hand and £50 invested. The work of the students' sketching club was exceptionally encouraging last year. Members are reminded that when travelling to excursion meetings from any station in Northumberland and Durham for distances exceeding 30 miles they can obtain a return ticket for single fare, from lesser distances for fare and a quarter, and at a minimum fare of 9d. in all cases.

The Bristol Society of Architects held its annual meeting last week, Mr. Frank W. Wills, president, in the chair. The following officers and council were elected:—President, Mr. Joseph Wood; vice-presidents, Messrs. G. H. Oatley and F. W. Wills; council, W. L. Bernard, F. Bligh Bond, J. H. La Trobe, Thomas Nicholson, W. S. Skinner, J. Foster Wood; hon. secretary and treasurer, H. Dare Bryan; associate members of council, Messrs. M. A. Green and T. H. Weston. A lecture devoted to architectural research was then delivered by Mr. J. Atwood Slater.

Jules Dalou, the eminent French sculptor, died last week at the age of sixty-four. Dalou had been one of the most prolific and greatest sculptors of the present generation in France. A Parisian, he became a pupil of Abel de Pujol, Duret and Carpeaux, entering the Beaux-Arts in 1853. His first work at the Salon was a *Dame Romaine jouant aux Osselets*, exhibited in 1861. During the Commune, Dalou helped with Barbet de Jouy to preserve the collections, but he was compelled to flee when the regular army entered Paris, and he took refuge in London. He reappeared at the Salon in 1873. The most famous of his works are the bas-relief of the Palais Bourbon, *Mirabeau répandant à M. de Dreux-Brézé, the Triomphe de la République*, placed in 1899 on the Place de la République, the *Triomphe de Silène*, a bronze group to be seen in the Luxembourg Gardens not far from the monument of Delacroix, and a bronze statue, his *Victor Noir*.

The Leeds and Yorkshire Architectural Society held its last meeting of the session last Thursday. Mr. Butler Wilson, F.R.I.B.A., was elected president for a second year, and Mr. R. Wood and Mr. G. F. Bowman were appointed vice-presidents, the former being re-elected. The secretary (Mr. H. S. Chorley) stated that there had been an increase of twenty-six in the membership during the year. The president observed that the aim of the council during the ensuing year would be to give effect to the proposal to provide increased facilities for students, notably in establishing a Chair of Architecture at the Yorkshire College—similar to that at Liverpool. Subsequently Mr. J. Starkie Gardner, F.S.A. gave a lecture on "Decorative Wrought Ironwork." He said that in the sixteenth century the English smiths far outtrivalled their Continental confrères in the design of metal-work, not from any advantages of site or materials, but from an innate love of form which Continental craftsmen, notwithstanding their culture and civilisation, were unable to equal. The age of wrought metal, said Mr. Gardner, had passed. Royalties and municipalities will not now expend the necessary amount so ungrudgingly and lavishly given in the days of Louis XIV. and XV., who expended many million livres upon this one craft. Cast iron and rolled steel have hastened this regrettable decline.

Three Stained-Glass Two-Light Windows have just been erected in Christ Church, Cheltenham, one on the south and two on the north side.

In St. Bartholomew's Church, Bristol, a stained-glass window has been placed as a memorial to the late Queen Victoria. It has been carried out by Messrs. J. Bell & Sons, of College Green, Bristol.

A Ballroom and Arcade at Rhyl are proposed to be erected on the Promenade. The scheme includes a ballroom 100ft. by 54ft., with lounges and open-air balconies, with a large stage capable of accommodating theatrical or variety performances, a cafe, roof gardens and an arcade containing thirty-five shops. The architect is Mr. Charles J. Richardson, of Poulton-le-Fylde, near Blackpool.

A New Coroner's Court has been erected by the Battersea Borough Council on land adjoining the public baths in Latchmere Road, with a frontage of 55ft. to Sheepcote Lane. On the ground floor are rooms for the coroner, doctors and attendant, lavatories, stores, post-mortem room, separate mortuaries for infectious and non-infectious cases, and viewing lobbies. On the first floor is the coroner's court, a spacious and well-fitted apartment, and there is a witnesses' room adjoining.

New Headquarters at Edinburgh are to be erected for the Queen's Rifle Volunteer Brigade. On the ground floor will be an armory with workshop, stores, stabling for service wagons, the orderly and the adjutant's room; and on the first floor the officers' quarters, rooms for company meetings, medical inspection room, and a large, lofty and fully-equipped gymnasium. The second floor is given over to the non-commissioned officers and to the men for whom are provided mess, billiard, recreation- and reading-rooms, with service rooms and lifts to kitchen, which is placed on the top floor. The third floor contains a large lecture hall seated for 320 persons, with retiring rooms, &c., a band room, and accommodation for the quartermaster's stores, the caretaker's house being on the attic floor. The buildings have been designed in the Scottish baronial style, and overlook the grounds of Heriot's Hospital. Messrs. Cooper & Taylor, 14B, George Street, Edinburgh, are the architects.

Masters and Men.

The Strike of Painters at Horwich for an increase of wages from 8d. to 8½d. an hour is practically settled. About half of the employers have conceded the advance and take on all the men on strike. Other employers have imported non-unionists. The employers say some of their number have broken the agreement, and the men resent the presence of non-unionists in the town.

Labour in March.—The Labour Department of the Board of Trade reports that the state of the labour market has somewhat improved during March in most of the important industries, and the general condition of employment is now almost as good as a year ago. Employment in the building trades is better than a month or a year ago. The percentage of unemployed union members among carpenters and plumbers at the end of March was 4.1, compared with 5.9 per cent. in February and 4.7 per cent. in March of last year. Twenty-one fresh disputes began in March, involving 6,285 workpeople, of whom 4,871 were directly and 1,414 indirectly affected. Of the new disputes, three took place in the building trades. The changes in rates of wages reported during March affected 198,499 workpeople, and the nett effect of all the changes was a decrease averaging 1s. 4½d. weekly per head.

OUR INSURANCE SCHEMES.

A Pamphlet, giving full details of the **THREE SCHEMES** will be sent on application to **THE MANAGER, BUILDERS' JOURNAL, EFFINGHAM HOUSE, ARUNDEL ST., STRAND, W.C.**

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
April 24	Arclid, Cheshire—Steam Road Roller Shed	Congleton Rural District Council	A. Price, Architect, Elworth.
" 24	Belfast—Business Premises	J. Riddel & Son	S. P. Close, Architect, Donegall Square Buildings, Belfast.
" 24	Ash-next-Sandwich—Ten Cottages	Co-operative Provision Society, Ltd.	F. J. Ralph, Lord Warden Inn, Sandwich.
" 24	Bury, Lancs—Conversion of House and Premises	Welsh Baptist Chapel Committee	D. Hardman, Architect, Agar Street, Bury.
" 24	Cork—Erection of National Monument	J. Ballantyne	D. J. Coakley, 1 Charlotte Quay, Cork.
" 24	Wrexham—Schoolroom	Cemetery Committee	Rev. J. Thomas, 47 Lorne Street, Rhosdu.
" 24	Amble—Alterations to Business Premises	H. J. Davies	J. Ballantyne, 83 & 90 Queen Street, Amble.
" 24	Blackpool—Greenhouses	Forw'd Aman Building Club	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 25	Troutbeck—Walling, &c.	West London School District Managers	J. Bingley, 7 Lowther Street, Kendal.
" 25	Aberaman, Aberdare—House	Highway and Sewerage Committee	T. Roderick, Architect, Clifton Street, Aberdare.
" 25	Aberaman, Aberdare—Two Houses, Stable, &c.	Town Council	W. E. Thomas, Architect, Pontypriid.
" 25	Aberaman, Wales—Thirty-four Houses	East Sussex County Council	T. Roderick, Architect, Clifton Street, Aberdare.
" 25	Ashford, Middlesex—Earth-Closets, &c.	Rural District Council	Superintendent at Schools, Ashford.
" 25	Leicester—Bridge Works	Committee of Visitors	E. G. Mawbey, Borough Surveyor, Town Hall, Leicester.
" 25	Boston, Lancs—Foundations for Municipal Buildings	Town Council	J. Rowell, Architect, Borough Office, Market Place, Boston.
" 25	Londonderry—Residence	Co-operative Society	J. P. McGrath, 28 Carlisle Road, Londonderry.
" 25	Uckfield, Sussex—Police Buildings	Corporation	F. J. Wood, County Surveyor, County Hall, Lewes.
" 26	Cockermouth—Bridges	Royal Asylum	J. B. Wilson, Court Buildings, Cockermouth.
" 26	Garlands, near Carlisle—Works at Asylum	Garn Calvinistic Methodist Church	G. D. Oliver, 5 Lowther Street, Carlisle.
" 26	Swindon—Alterations, &c., to Church	Corporation	R. J. Beswick, 35 Regent Street, Swindon.
" 26	Scarborough—Foundations of Hospital	Co-operative Society, Ltd.	H. W. Smith, Borough Engineer, Town Hall, Scarborough.
" 27	Supperston, near Canterbury—Farm Buildings	Rivers Committee	G. Smith, 34 S.E.R., Station Road, Canterbury.
" 28	Esh Winning, near Waterhouses, Durham—Store	Metropolitan Asylums Board	W. & T. R. Millburn, Architects, Sunderland.
" 28	Salford—Alterations to Technical Institute	Mynyddiswyn School Board	H. Lord, Architect, Deansgate, Manchester.
" 28	Sunnyside, near Montrose, Scotland—Villa	Isolation Hospital Committee	J. Sim, 160 High Street, Montrose.
" 28	Lamphange—Rebuilding Schoolroom	School Board	J. A. Jones, Architect, Aberystwyth.
" 28	Lumphinnans, Scotland—Public-House, &c.	Repton Isolation Hospital Committee	W. Birrell, 209 High Street, Kirkcaldy.
" 28	Pontefract—Two Workmen's Dwellings	London County Council	A. Oddy, Borough Surveyor, Municipal Offices, Pontefract.
" 28	Garncliffe—Twenty Cottages	North-Eastern Railway Co.	O. H. Wilcox, Secretary, Stores, Garncliffe.
" 28	Manchester—Cement	North-Eastern Railway Co.	Secretary, Rivers Department, Town Hall, Manchester.
" 28	Leavesden, near Watford, Herts—Asylum Buildings	Lancs & Yorks Bank, Ltd.	T. D. Mann, Board's Offices, Embankment, E.O.
" 28	Fleur-de-Lis, Mon.—School	J. Mulholland	K. L. Roberts, The Firs, Abercarn, Mon.
" 29	Templepatrick, Ireland—Church	Corporation	Young & Mackenzie, Architects, Belfast.
" 29	Meltham, near Huddersfield—Hospital Buildings	Cleansing Committee	J. Berry, 3 Market Place, Huddersfield.
" 29	Ballymore, Ireland—Rectory	St. Pancras Parish Guardians	R. E. Buchanan, Architect, Castle Street, Londonderry.
" 29	Owynystwyth, Wales—School Buildings	Management Committee	J. A. Jones, 7 Queen's Terrace, Aberystwyth.
" 30	Etwell, Derby—Isolation Hospital	Urban District Council	A. Eaton, 6 St. James Street, Derby.
" 30	Glass, Aberdeenshire—Extension, &c., of Church	Corporation	J. Robertson, Architect, Inverness.
" 30	London, E.—Shelter, Conveniences, &c.	Corporation	Architect's Department, County Hall, Spring Gardens, S.W.
" 30	Low Fell—Additions, &c., to Station Buildings	Corporation	W. Bell, Company's Architect, Central Station, Newcastle-on-Tyne.
" 30	Middlesbrough—Opera House	Corporation	W. Hope & J. O. Maxwell, Architects, Trinity Buildings, New Bridge Street, Newcastle.
" 30	Scarborough—Retaining Wall and Pipe Subway	Corporation	W. J. Oudworth, Company's Engineer, York.
" 30	Blackburn—Bank Premises	Corporation	Stones & Stones, 10 Richmond Terrace, Blackburn.
" 30	Whitley Bay—Rebuilding Premises	Corporation	F. R. N. Haswell, 77 Tyne Street, North Shields.
" 30	Newlyn East, Truro—Stable, Store-house, &c.	Corporation	G. Gow, Tregothan Office, Truro.
May 1	Wickford, Essex—Pair of Cottages	Corporation	F. Whitmore, Architect, Chelmsford.
" 1	Exeter—Rebuilding Hotel	Corporation	E. H. Harbottle & Son, Architects, County Chambers, Exeter.
" 1	Dublin—Additions to Hospital	Corporation	A. B. Bruntz, 1 College Street, Dublin.
" 3	Ventonleague, Hayle, Cornwall—Enlargment of Church	Corporation	S. Hill, Architect, Green Lane, Redruth.
" 3	St. Agnes—Residence	Corporation	G. O. Hancock, junr., Solicitor, St. Agnes.
" 3	Sully, near Cardiff—Residence, &c.	Corporation	Veall & Sant, Architects, Cardiff.
" 3	Chadwell Heath, Essex—Farm Buildings at Asylum	Corporation	Borough Engineer, Town Hall, West Ham, E.
" 5	Wallington, Surrey—Seven Shops and Houses	Corporation	Warren & Stupart, 385 Green Lanes, Harringay, N.
" 5	Aberporth, Wales—House and Outbuildings	Corporation	D. Morris, Land Surveyor, Cardigan.
" 5	Burton-on-Trent—Dwellings, Cottages, Fire Station, &c.	Corporation	Borough Surveyor, Burton-on-Trent.
" 6	Bradford—Cement, Lime, &c.	Corporation	E. Call, Assistant Superintendent, Hammerton St. Depot, Bradford.
" 7	Callington, Cornwall—Chapel	Corporation	Rev. J. Datson, Launceston Road, Callington.
" 8	London, N.W.—Receiving Home for Children	Corporation	A. E. Fridmore, 2 Broad Street Buildings, E.O.
" 10	Bondarun, Ireland—Rebuilding House	Corporation	W. S. Jervois, Architect, Armagh.
" 13	Donabate, co. Dublin—Gate Lodge, Cottages, &c.	Corporation	G. Lennon, Clerk, Richmond Asylum Offices, Grangegorman, Dublin.
" 22	Charmminster—House for Private Patients at Asylum	Corporation	G. T. Hine, 35 Parliament Street, S.W.
ENGINEERING:			
April 24	Mildenhall, Suffolk—Gas Fittings and Gasometers	Guardians	F. E. Bloss, Clerk, Mill Street, Mildenhall, Suffolk.
" 24	Mildenhall, Suffolk—Two Mains	Gas Co., Ltd.	O. F. Read, Clerk, Mildenhall.
" 24	Dundee—Engine and Dynamo	Gas Commissioners	W. H. Tittensor, City Electric Engr., Diddop, Crescent Rd., Dundee.
" 24	Rathmines, Ireland—Engine-House Plant, &c.	District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 24	Hull—Pipe Work, Pumps, Motors, &c.	Electric Lighting Committee	T. G. Milner, City Treasurer, Town Hall, Hull.
" 25	Maidenhead—Boiler Setting, &c.	Town Council	P. Johns, Borough Surveyor, Guildhall, Maidenhead.
" 25	Dittisham, Tonnes, Devon—Laying Water-Main, &c.	Rural District Council	W. F. Toldt, Surveyor, Tonnes.
" 25	West Hartlepool—Sewerage Works	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
" 26	Hull—Pumping Machinery	Corporation	F. J. Bancroft, City Engineer, Alfred Gelder Street, Hull.
" 28	George Town, Penang—Electrical Plant	Municipal Commissioners	Preece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 28	Bexley Heath, Kent—Tramway Requisites	Electric Lighting & Traction Committee	Morley & Dawbarn, 82 Victoria Street, Westminster, S.W.
" 28	Glasgow—Ferry Boat	Clyde Navigation Trustees	G. H. Baxter, 16 Robertson Street, Glasgow.
" 28	Nelson, Lancs—Overhead Equipment of Tramways	Tramways Committee	W. A. Fraser, Electrical Engineer, Electricity Works, Nelson.
" 28	Edinburgh—Electricity Meters	Lord Provost, Magistrates and Council	Resident Electrical Engineer, Dwar Place, Station, Edinburgh.
" 28	Rhyl—Electric Light Wiring of Town Hall	Urban District Council	E. H. Wright, Electricity Works, Rhyl.
" 28	Hastings—Warming and Hot Water Supply, &c.	Corporation	P. H. Palmer, Town Hall, Hastings.
" 28	Leamington—Turbine, &c.	Corporation	W. de Normanville, Engineer, Town Hall, Leamington.
" 29	Lanchester—Sewage-Disposal Works	Rural District Council	J. B. Lupton, Surveyor, Lanchester.
" 29	Kilmarnock—Gasholder	Gas Committee	W. Fairweather, Engineer, Kilmarnock.
" 29	Sevenoaks—Waterworks	Rural District Council	T. Hennell, 6 Delahay Street, Westminster.
" 30	Biggleswade—Well	Water Board	G. F. Deacon, 16 Great George Street, Westminster, S.W.
" 30	Scarborough—Pipe Subway, &c.	North-Eastern Railway Co.	W. J. Oudworth, Engineer, York.
" 30	West Hartlepool—Extension of Refuse Destructor	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
" 30	Hull—Two Floating Pontoon Docks	North-Eastern Railway Co.	T. M. Nowell, Engineer, Dock Office, Hull.
" 30	Trowbridge—Electric Lighting	Urban District Council	T. S. Hill, Clerk, Council Offices, Town Hall, Trowbridge.
" 30	Bradford—Air Compressor	Corporation	J. Garfield, Sewage Works Engineer, Frizinghall, Bradford.
" 30	Charvill, Berks—Reconstructing Bridge	Urban District Council	J. Morris, 156 Frier Street, Reading.
" 30	Newport, Salop—Automatic Apparatus for Contact Beds	East Indian Railway Company	W. Wyatt, 99 Rodford Road, Leamington.
May 1	London, E.C.—Good Engines, &c.	Corporation	O. W. Young, Secretary, Nicolas Lane, E.O.
" 1	Sudbury, Suffolk—Electrical Plant	Corporation	W. B. Ransom, Town Clerk, Town Hall, Sudbury, Suffolk.
" 1	Leeds—Hot-Water Apparatus	District Council	Part-Superintendent, Roundhay, Leeds.
" 1	Rathmines, Ireland—Engine-house Plant, &c.	Corporation	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 1	Mansfield—Electrical Plant	Corporation	R. Hammond, 64 Victoria Street, S.W.
" 2	South Petherton—Waterworks	Yeovil Rural District Council	J. E. Rodger, Clerk, 30 Kingston, Yeovil.
" 3	Manchester—Tramway Track Work	Tramways Committee	J. M. McElroy, 55 Piccadilly, Manchester.
" 3	Tadcaster—Water-Supply Works	Rural District Council	Bromet & Thorman, Engineers, Tadcaster.
" 3	Glasgow—Engine	Corporation	D. H. Morton, 130 Bath Street, Glasgow.
" 6	Oldham—Switchboards	Corporation	A. Andrew, Gas and Water Offices, Oldham.
" 6	High Wycombe & Princes Risborough—Widening Rly. &c.	Great Western & Great Central Railways	Engineer of Great Western Railway, Paddington Station.
" 6	Princes Risborough and Grendon Underwood—Railway	Great Western & Great Central Railways	Engineer of Great Central Railway, London Road Station, Manchr.
" 7	Sydney, N.S.W.—Electrical Plant, &c.	Municipal Council	Preece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 7	Aberdeen—Electrically-Driven Crane	Electric Lighting Committee	J. A. Bell, City Electrical Engineer, Cotton Street, Aberdeen.
" 11	Alexandria, Egypt—Bencon Buoys, &c.	Ports and Lighthouses Administration	Controller-General, Ports and Lighthouses, Alexandria.
" 12	Calcutta—Sand Washers	Corporation	Engineer, Municipal Office, Calcutta.
" 12	Harrowgate—Light Railway	Corporation	E. W. Dixon, 14 Albert St, Harrogate.
" 30	Sydney, N.S.W.—Bridge across Harbour	Corporation	Under-Secretary for Public Works, Sydney.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL:			
April 24	Plymouth—Cast-iron Pipes	Water Committee	F. Howarth, Water Engineer, Municipal Buildings, Plymouth.
" 25	Audenshaw, Lancs.—Cast-iron Gully Grids, Manhole.	Urban District Council	W. Clough, 2 Guide Lane, Hooley Hill, Audenshaw.
" 26	Swinton—Wrought-iron Pipes, &c. .. .	Corporation	Borough Surveyor, Town Hall, Swinton.
" 28	Barnsley—Pipes	Corporation	T. & O. Hawksley, 30 Great George Street, Westminster, S.W.
" 29	London, W.—Girder Work	Great-Western Railway Co. .. .	Engineer, Paddington Station.
" 30	Darlington—Steelwork	North-Eastern Railway Co. .. .	W. J. Oudworth, Company's Engineer, York.
May 6	Bradford—Iron, Steel, Bolts and Nuts .. .	Cleansing Committee	E. Call, Assistant Superintendent, Hammerton St. Depot, Bradford.
" 15	Rochester—Cast-iron Socket Pipes, &c. .. .	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
PAINTING AND PLUMBING:			
April 24	Wolverhampton—Painting, Paperhanging, &c. .. .	Union Guardians	Superintendent, Cottage Homes, Wednesfield.
" 25	Pontefract—Painting and Decorating Chapel .. .	Corporation	Tennant & Bagley, Architects, Pontefract.
" 26	Carlisle—Painting	Union Guardians	H. C. Marks, 36 Fisher Street, Carlisle.
" 28	Chelmsford—Repairs, Painting, &c. .. .	Union Guardians	Master, Union Workhouse, Wool Street, Chelmsford.
" 28	Croydon—Painting &c., at Hospital	Union Guardians	Borough Engineer, Town Hall, Croydon.
" 30	Annan, Scotland—Painting	Union Guardians	J. Laurie, Clerk, Parish Council Chambers, Annan.
May 13	Croydon—White Lead, Oils, Colours, &c. .. .	School Board	B. Rule, Clerk, Offices, Catherine Street, Croydon.
ROADS AND CARTAGE:			
April 24	Houghton-le-Spring, Durham—Materials .. .	Rural District Council	D. Balfour, Surveyor, Houghton-le-Spring.
" 24	Huddersfield—Materials	Whitley Upper Urban District Council .. .	J. Sharp, Clerk, Queen Street, Huddersfield.
" 24	Pentre, Rhondda, Wales—Levelling, &c. .. .	Rhondda Urban District Council .. .	W. J. Jones, Surveyor, Council Offices, Pentre, Rhondda.
" 24	Rugby—Roads, &c.	Benefit Building Society	J. T. Franklin, Architect, Regent Street, Rugby.
" 26	Newmarket—Granite Metalling	Urban District Council	S. J. Ennion, Clerk, Deva Chambers, Newmarket.
" 26	Audenshaw, Lancs.—Materials	Urban District Council	W. Clough, 2 Guide Lane, Hooley Hill, Audenshaw.
" 26	Audenshaw, Lancs.—Road Works	Urban District Council	W. Clough, 2 Guide Lane, Hooley Hill, Audenshaw.
" 26	Bradford—Road Metal	Urban District Council	J. H. Cox, City Surveyor, Town Hall, Bradford.
" 26	Sandwich—Granite, &c.	Corporation	Town Clerk, Sandwich.
" 28	Woodford, Essex—Materials and Stores .. .	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
" 28	Woodford, Essex—Watering Vans	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
" 28	Petworth, Sussex—Materials, &c.	Rural District Council	Council's Surveyor, Fox Hill, Petworth.
" 28	Swindon—Tar Asphalt	Hospital Board	Halliday & Rodger, 14 High Street, Cardiff.
" 28	Uckfield, Sussex—Materials	Urban District Council	C. Dawson, Clerk, Council Offices, Uckfield.
" 28	Walton-on-Thames—Street Watering	Urban District Council	C. J. Jenkin, Surveyor, Council Offices, Walton-on-Thames.
" 28	Whitley, Northumberland—Street Works .. .	Urban District Council	J. Moore, Surveyor, Council Offices, Whitley Bay.
" 28	Woodford, Essex—Materials	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green.
" 29	Isleworth—Roadways	Brentford Union Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
" 29	Acton—Making-up	District Council	D. J. Ebbetts, 242 High Street, Acton.
" 30	Arundel, Sussex—Flints	St. Mary's Burial Board	A. Holmes, Town Clerk's Office, Arundel.
" 30	Harrogate—Asphalting	Fulham Borough Council	H. Horner, 9 Royal Parade, Harrogate.
" 30	London, S.W.—Making-up and Paving Roads .. .	Rural District Council	F. Wood, Borough Surveyor, Town Hall, Waltham Green, S.W.
" 30	Croydon—Materials	Whitworth Urban District Council .. .	Surveyor, Town Hall, Croydon.
" 30	Facit, Lancs.—Materials	Town Council	T. Biker, Surveyor, Facit, near Rochdale.
" 30	Gravesend—Wood Block Paving	Urban District Council	Borough Surveyor, Town Hall, Gravesend.
" 30	Wood Green—Making-up Road	Urban District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green.
May 1	London, W.—Road Works	Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.
" 2	Ashford, Kent—Broken Granite	Urban District Council	W. Terrill, Surveyor, North Street, Ashford, Kent.
" 2	Eastbourne—Materials, &c.	Rural District Council	T. E. Klotian, 82 Terminus Road, Eastbourne.
" 5	London S.W.—Vans and Trucks	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, East Hill, Wandsworth.
" 5	London, N.—Road Works	Hornsey Urban District Council .. .	E. J. Lovegrove, Engineer, Southwood Lane, Highgate, N.
" 6	Hetton-le-Hole, Durham—Materials	Urban District Council	J. Harding, Surveyor, Council Offices, Hetton-le-Hole, R.S.O.
" 6	Windsor—Making-up, &c.	Town Council	Borough Surveyor, Alma Road, Windsor.
SANITARY:			
April 25	Ashby-de-la-Zouch—Sewer	Rural District Council	J. E. Holroyd, 2 Avenue Road, Ashby-de-la-Zouch.
" 25	Audenshaw, Lancs.—Stoneware Pipes, Gulleys, Cement .. .	Urban District Council	W. Clough, 2 Guide Lane, Hooley Hill, Audenshaw.
" 28	Woodford, Essex—Stoneware Pipes, Lime, &c. .. .	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
" 28	Penham, Northumberland—Sewers	Urban District Council	H. W. Taylor, Engineer, St. Nicholas Chambers, Newcastle.
" 28	Sittingbourne—Sewerage Works	Urban District Council	J. O. Melliss, 264 Gresham House, Old Broad Street, E.C.
" 28	Hayfield—Sewers, &c.	Rural District Council	H. Bancroft & Son, 83 Mosley Street, Manchester.
" 29	Malling, Kent—Sewerage Works	Rural District Council	H. Robinson, Parliament Mansions, Victoria Street, Westminster.
" 29	Lanchester—Sewage-Disposal Works	Rural District Council	J. R. Lupton, Surveyor, Lanchester.
" 29	Folkestone—Road and Sewer Works	Corporation	A. E. Nichols, Bor. Engr., Corporation Offices, Church St., Folkestone.
" 29	Stanley, Durham—Scavenging	Urban District Council	J. T. Coulson, Inspector of Nuisances, Stanley.
" 30	Ware, Herts—Sewer, &c.	Rural District Council	H. J. Jackson, Surveyor, Rye Road, Hoddesdon.
" 1	Gateshead—Sewer	Corporation	J. Bower, Borough Engineer, Town Hall, Gateshead.
" 2	Yeovil—Sewerage Works	Rural District Council	J. E. Rodber, Clerk, 30 Kingston, Yeovil.
May 5	Bishop Auckland—Sewers, &c.	Rural District Council	C. Johnston, Surveyor, Crofton House, Bishop Auckland.
" 8	Derby—Sewerage Works	Corporation	J. Mansergh & Sons, 5 Victoria Street, Westminster.
" 13	Richmond—Lime, Sulphate of Alumina, Filter Cloth, .. .	Main Sewerage Board	W. Fairley, Engineer, Kew Gardens.
" 14	Brightlingsea, Essex—Scavenging	Urban District Council	W. J. Osborn, Clerk, Foresters' Hall, Sydney Street, Brightlingsea.
TIMBER:			
April 24	Southampton—Timber	Director-General, Ordnance Survey .. .	Officer in Charge of Stores, Ordnance Survey Office, Southampton.
" 28	York—Sleepers Blocks and Crossing Sleepers, &c. .. .	North-Eastern Railway Co. .. .	Secretary, York.
" 28	Woodford, Essex—Timber	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
May 6	Bradford—Timber	Cleansing Committee	E. Call, Hammerton Street Depot, Bradford.
" 8	Hammersmith, W.—Re-laying Wood Floors .. .	Fulham Parish Guardians	E. J. Mott, Clerk, Fulham Palace Road, Hammersmith, W.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 30	Glasgow—Branch Library (Local Architects) .. .	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria street, Westminster.
" 1	York—Queen Victoria Memorial	£50.	N. H. Andrew, Town Clerk, Guildhall, York.
" 1	Mexborough, near Rotherham—Accident Hospital .. .	£35 £10.	J. Brampton, Fern Villa, Mexborough.
" 14	Harrogate—Town Hall	£150, £100, £75.	A. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 1	Knaresborough—Infectious Disease Hospital	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 16	Hartshill, Stoke-on-Trent Nurses Home	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Design in any Style to be submitted).	—	Ion. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings .. .	£100, £50 £25.	Borough Engineer, Town Hall, Sunderland.
Sept. 1-14	St. Petersburg—Bridges over Great Nava River .. .	—	A. Petersburg Korodskaya uprava, St. Petersburg.
No Date.	Cove, Hants—Orphanage	—	I. G. Warne, Secretary, L. & S.W. Rly. Servants' Orphanage, Jeffrey's Road, Clapham, S.W.

Trade and Craft.

Two New Catalogues.

We have before us the catalogue of Messrs. Adams & Co., of Leeds, and other places so numerous that there is scarcely a district of importance in the United Kingdom where the firm is not represented by showrooms and local offices. The catalogue has a white cover embellished with a tree design in black and red. Besides fifty-five foolscap pages of detailed information of the various specialities, well illustrated throughout, there are separate pages showing actual work done—public conveniences, hotel lavatories, &c., work which Messrs. Adams have executed very admirably. A smaller catalogue of a handy pocket size, though similar in style and appearance, has also been issued. Both contain detailed descriptions of work done in the firm's special "Titanite" ware as well as particulars of the ware itself and its adaptations.

Asphalts.

Messrs. Pilkington & Co., of Monument Chambers, King William Street, London, E.C., issue a useful little pamphlet on asphalt, stating where the different varieties are obtained, their special merits, and how they should be employed. Pyramont Seyssel asphalt, which is generally acknowledged to be the best procurable, is a natural product, a bituminous limestone, procured from the celebrated mines of Pyramont, in the district of Seyssel, in the Jura Mountains, Dept. de l'Ain, France. The rock, after being ground to a fine powder, is placed in large cauldrons with a small percentage of natural bitumen (in some asphalt a large percentage of heavy oils is substituted for natural bitumen in order to reduce the cost, thus rendering the material unreliable and less durable), and when brought to a temperature of about 350° Fabr. is stirred by machinery until thoroughly amalgamated and reduced to a mastic state. The mass is then run into moulds and cast into cylindrical cakes, with the brand embossed on side and top. This material, which has been almost exclusively used on all Government works, is specially suitable for covering flat roofs and terraces, and also for paving corridors, courtyards, tennis courts, malt floors and for brewery work generally. It is also very well adapted for lining reservoirs, tanks, swimming baths, aquaria, &c. Limmer asphalt is a natural product procured from the mines in the neighbourhood of Limmer, Hanover. It is prepared and treated in the same manner as Seyssel, to which it is similar, but is considered inferior to that material for most purposes; it is, however, somewhat cheaper. Polonceau asphalt is manufactured solely by Messrs. Pilkington from an analysis of Seyssel asphalt, and contains the same component parts, though it is considerably cheaper. Polonceau asphalt is very suitable for paving cartways and approaches to warehouses, &c.,

where very heavy traffic occurs. In this case it is made harder than usual and is laid 3in. thick, the first layer being composed of asphalt-concrete 2in. thick, with 1in. of fine asphalt laid on top. Polonceau asphalt has been tested for thrusting stress by Messrs. Kirkaldy & Son with very satisfactory results. Lava asphalt is a good ordinary British variety, and is suitable for similar purposes to Polonceau asphalt in cases where it is necessary to reduce the cost to the lowest limit. White silica asphalt is suitable for paving corridors, terraces, &c., or for lining ornamental fountains, &c. Messrs. Pilkington have also introduced a patent acid-resisting asphalt, which is specially suitable for laboratories, battery-rooms of electric-light stations, &c.

Roof Trusses.

Roof trusses on Holt's system—equi-sided and saw-tooth, steel and timber combined—are supplied by Messrs. Andrew Handyside & Co., Ltd., of Derby and London. The rafters and struts are of timber, the tee-rods of steel, and the connections of cast-iron, and the advantages claimed for this construction are (1) that the cost is small, (2) that the truss can be fixed by unskilled labour and is very portable, (3) that it is much stronger and lighter than an all-timber roof and cheaper than an all-steel one. The principle is one which can be used most advantageously in the construction of roofs for workshops, mills, factories, &c.; the roof can be covered with corrugated sheeting, boards and slates, or with boarding, felt and glass, as circumstances demand; moreover it is well adapted for export, the iron connections being packed for shipment and the timber supplied abroad to suit them. The cost of a 20ft. span is £1 7s. for ironwork and 15s. for timber, for a span of 30ft. £1 10s. 6d. and £1 5s. respectively, for a span of 40ft. £3 7s. and £1 12s. 6d., and for a 50ft. span £4 18s. and £3 2s. The London offices of the firm are at 104, Queen Victoria Street, E.C.

Earle's Cement.

Messrs. G. & T. Earle, Ltd., of Wilmington, Hull, send us a copy of their new catalogue giving particulars of the tests made to secure a trustworthy cement. Messrs. Earle offer a special advantage in this respect in their "Lead-Sealed Pelican Brand," for practically every bag sent out of the works is tested, samples being taken from every two tons made. Every bag is guaranteed and has a lead seal attached to a coloured tag, a different colour being used for each month, so that it can be seen at once what month the sack was filled in. Tests made by Messrs. Henry Fajia & Co., 41, Old Queen Street, Westminster, London, S.W., of their day-by-day manufacture for October, November and December 1901 show that the difference between their seven days' tensile strain test, neat cement, on lin. section (one day in air, six days in water), is only that between 883lbs. for the day-by-day manufacture for November and 866lbs. for the day-by-day

manufacture for October, a difference in all of 17 lbs. on the month's manufacture, and that for the three months there is only 43lbs. difference between the highest and lowest seven days' test in October, November and December, namely 866lbs. for October and 909lbs. for December. As few engineers' and architects' specifications ask for more than 400lbs. tensile strain upon the lin. section (one day in air, six days in water), and never exceed 500 lbs., there is a considerable margin. A remarkable testimonial to the quality of Earle's cement is afforded by the Corporation of Salford having used 15 parts of broken brick to 1 of cement.

COMING EVENTS.

Wednesday, April 23.

INSTITUTION OF CIVIL ENGINEERS (Special Meeting: Tenth "James Forrest" Lecture).—Sir William Chandler Roberts-Austen on "Metallurgy in relation to Engineering," 8 p.m. Students' Visit to the Works of the Great Northern and City Railway in course of construction, at 2.30 p.m.

SOCIETY OF ARTS.—Professor Silvanus P. Thompson, D.S.C., F.R.S. on "Opto-Technics," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, M.D., on "The Hygiene of Byres, Lairs, Cow Sheds, and Slaughter-Houses," 7 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Business Meeting, and President's Valedictory Address by Mr. Henry F. Kerr, A.R.I.B.A.

SOCIETY OF ANTIQUARIES OF LONDON.—Anniversary Meeting at 2 p.m.

Thursday, April 24.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Charles E. Keyser, F.S.A., on "Some Ancient Wall Paintings."

SOCIETY OF ARCHITECTS.—Mr. S. W. Kerzhaw, M.A., on "Ancient Hampshire Palaces," 8 p.m.

ROYAL INSTITUTION.—Prof. Dewar on "The Oxygen Group of Elements"—III., 8 p.m.

Friday, April 25.

ARCHITECTURAL ASSOCIATION.—Mr. E. A. Gruning, F.R.I.B.A., on "Arbitrations," 7.30 p.m.

SOCIETY OF ARCHITECTS.—Visit to the Roman Catholic Cathedral, Ashley Gardens, Victoria Street, Westminster, at 2.30 p.m. Annual Dinner at the Princes' Restaurant, Piccadilly, W., at 6.30 p.m. Mr. Silvanus Trevel, President, in the Chair.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Sir William Chandler Roberts-Austen, K.C.B., F.R.S., on "Metallurgy in relation to Engineering," 4 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Business Meeting.

ROYAL INSTITUTION.—Dr. J. Mackenzie Davidson on "X-rays and Localization," 9 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, M.D., on "The Laws, By-laws and Regulations affecting the Inspection and Sale of Meat and other Articles of Food," 7 p.m.

Saturday, April 26.

ARCHITECTURAL ASSOCIATION.—Sixth Spring Visit to the New Fire-Station, Perry Vale, Forest Hill S.E., and Horniman's Museum.

NORTHERN ARCHITECTURAL ASSOCIATION.—First Summer Visit to New Buildings in Dean Street and Collingwood Street, Newcastle, at 2.45 p.m.

Monday, April 28.

SURVEYORS' INSTITUTION.—Ordinary General Meeting.

Tuesday, April 29.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Professor R. Elsey Smith on "Notes on Some Churches and Chateaux in the Valley of the Loire," 7.30 p.m.

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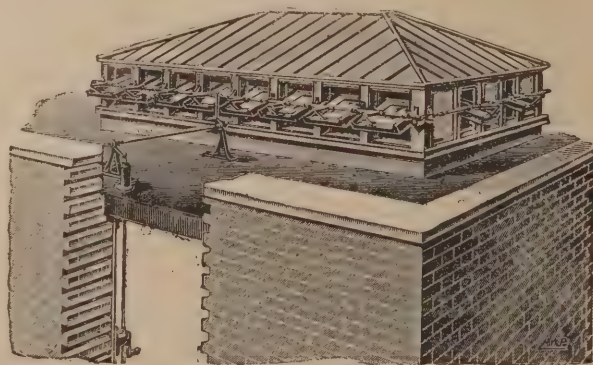
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Wednesday, April 30.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

SOCIETY OF ARTS.—Mr. Edward T. Scammell on "The Timber Resources of the Australian Commonwealth," 8 p.m.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Mr. E. R. Oalthrop, M.I.M.E., on "Narrow Gauge Light Railways of Heavy Traffic Capacity."

RUSKIN SOCIETY OF BIRMINGHAM.—Annual Meeting. Mr. H. Lowerson on "Ruskin's Educational Theories," 7.45 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CAERPHILLY, WALES.—The tender of Mr. A. J. Rossiter of Castle Street, Cardiff, was the accepted one for the construction of settling and straining tanks, &c., at the sewage farm, Gwaunbarra; and not that of Mr. Page, as stated on page xv. of our issue for April 9th.

CHELMSFORD.—For bank and manager's house at Chelmsford for the Capital and Counties Bank, Ltd. Messrs. Clare & Ross, A.R.I.B.A., architects, 1 West Street, Finsbury Circus, E.C., and Chelmsford. Quantities by Mr. J. B. H. Low, surveyor, 67 Cheapside, E.C.

Sheffield Bros., London, W. £6,658
F. Johnson, Chelmsford 6,100
A. Moss & Co., Chelmsford 5,996
E. West Chelmsford 5,859
J. Smith & Son, Witham 5,795
* Amended tender accepted on reduced quantities.

CROYDON.—For enlargement of Croydon Crown Post Office, for H.M. Office of Works, &c. :—

J. Longley & Co.	£4800	A
W. Potter	3,930	—
C. Jackson	3,837	—
S. Coffin & Son	3,809	—
Wilson Bros. & Lamplough	3,691	—
E. Smart & Son	3,600	—
B. E. Nightingale	3,567	—
H. Lacey & Son	3,555	—
General Builders, Ltd.	3,474	10
Cropley Bros., Ltd.	3,447	10
W. Smith & Sons	3,300	50
J. Smith & Sons, Ltd.	3,350	10
Viney & Stone	3,333	5
W. H. Lorden & Son	3,333	—
Edwards & Medway	3,201	25
T. Vaughan	3,237	20
Turtle & Appleton	3,225	25
T. Almond & Sout	3,013	16
A. Old material.	—	—

* Accepted. * Withdrawn.

EGHAM.—For new classrooms and alterations to the Station Road Schools, for the Egham School Board. Mr. James W. Oades, Egham, architect and surveyor.

G. Gray £1,837 W. Beauchamp £1,609
W. Searle 1,687 C. Buckeridge 1,637
* Accepted.

ERITH (KENT).—For private street works in Norman Road, Caldy Road, and Station Road North, Belvedere, for the Erith Urban District Council. Mr. A. H. Jennings, surveyor :—

W. Thair & Co., Salisbury Road, Bexley	£3,135	12	6
Lawrence & Thacker, 41 Lavender Gardens	2,880	1	9
A. T. Catley, 23 Lloyd Square, W.C.	2,780	0	0
Free & Son, Maidenhead	2,740	2	5
G. Bell, Tottenham	2,630	2	1
T. Adams, Wood Green, N.	2,619	2	4
Road Maintenance and Stone Supply Com- pany, Gravesend	2,514	3	0
Wilson, Border, & Co., 1 Derby Gardens, Seven Kings	2,442	10	2
W. H. Wheeler, 235 Blackfriars Road, S.E.	2,336	8	7
R. Ballard, Child's Hill, N.W.	2,312	5	10

[Surveyor's estimate, £2,407 9s. 9d.]
* Provisionally accepted.

HAYWARDS HEATH (SUSSEX).—For the construction of a new sewer in the Balcombe Road and College Road, Haywards Heath, with the necessary manholes, &c., for the Cuckfield Rural District Council. Mr. W. Beach, surveyor :—

Soan, Streatham	£3,550	King, Worthing	2,900
Rayner, Croydon	2,985	Ancombe & Hedgecock,*	—
Ossenton, Westerham	2,922	Lindfield	1,983
Collins	2,900	Ketteringham	1,965
Pedrette, London	£2,573	* Accepted.	—

ILKESTON.—For Contract No. 2, Meerbrook Sough pumping station and Chadwick Nick service reservoir, for the Ilkerton and Heanor Water Board. Messrs. G. & F. W. Hodson, engineers, Loughborough and Westminster :—

J. & T. Bluns, Croydon	£61,302
B. Cooke & Co., Westminster	57,850
J. H. Vickers, Ltd., Nottingham	57,000
P. Drake, Bradford	55,000
J. F. Price, Nottingham	51,700
W. Moss & Sons, Ltd., Loughborough	48,750
T. Smart, Nottingham	48,500
H. Ashley, Mansfield	48,200

LITHELAND (LANCS.).—For the kerbing, channelling, flagging, and necessary cast-iron gulleys, &c., of the footwalks in Linacre Road from Bridge Road to the Boodle boundary, for the Urban District Council. Mr. A. H. Carter, surveyor :—

T. Rowland, Liverpool	£3,156
Roberts & Owen, Liverpool	3,361
L. Marr & Sons, Liverpool	2,578
W. Owens, Liverpool	2,485
J. Joyson, Liverpool	2,457
P. Tyson, Liverpool	2,360
R. Chadwick, Liverpool	2,329
P. Balmer,* Aintree	2,197

* Accepted.

LLANEDY (CARMARTHEN).—For the erection of a new school at Tycores, Llanedy, for the Llanedy School Board. Messrs. J. Davis & Son, M.S.A., Cowell House, Llanelly, architects :—

J. Vaughan, Tycores, Pantyffynnon	£2,010
J. Thomas, Pantyffynnon	2,010
Brown, Thomas and John, Llanelly	1,519
B. Howell & Son, Limited,* Llanelly	1,503

* Accepted.

LONDON, E.—For the construction of new floors, &c., at Mill-wall, for the Electrical Power Storage Company, Limited. Mr. Alfred Roberts, architect, Greenwich, S.E.

Yates & Co.	£2,193	H. Groves	£1,689
W. Mills	1,798	W. Martin*	1,687
T. D. Leng	1,737	* Accepted.	—

LONDON, W.—For alterations to Notting Dale police-station. Mr. Dixon Butler, architect :—

Willmott & Sons	£3,040	F. & H. F. Higgins	£2,094
T. Boyce	2,978	Lascelles & Co.	2,088
Higgs & Hill	2,884	J. Parker	2,070
Lathey Bros.	2,747	Grover & Sons	2,025
Holloway Bros.	2,740	C. Ansell	2,585

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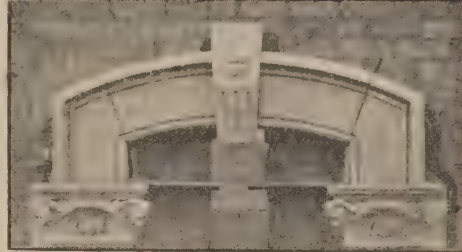
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LONDON N.—For building married couples' quarters at the workhouse, Silver Street, Edmonton, for the Guardians of the Strand Union. Mr. A. A. Kekwiah, architect, 18 outer Temple, Strand. Quantities supplied—
Chessum & Sons, Monier Road, Bow ... £1,872
Willmott & Sons, Hornsey ... 4,770
Dearing & Son, Hallelord Street ... 4,859
Lawrence & Son, Canal Works, Waltham ... 4,503
J. Appleby, Stamford Street, S.E. ... 4,530
B. E. Nightingale, Albert Works, Lambeth ... 4,512
Shillitoe & Son, Bury St. Edmunds ... 4,500
Jarvis & Sons, Hackney Road ... 4,446
Foster Bros., Norwood Junction ... 4,687
T. G. Sharpington, Kimberley Road, Nunhead ... 4,349
A. Monk, Lower Edmonton ... 4,330
J. O. Richardson, Albert Works, Peckham ... 4,063
* Recommended for acceptance.

PATRINGTON (near HULL).—For the erection of a new workhouse infirmary at Patrington, for the Guardians of Patrington Union. Messrs. Ranton and Barry, architects, Savile Chambers, Hull.—

Kirkwood ... £2,298 0 0
Foley, Beverley ... 2,272 0 0
C. Bullock, Hessle, near Hull ... 2,248 0 0
T. Goates ... 2,237 17 0
G. H. Scorer ... 2,067 10 2
J. Kirkwood, Patrington ... 2,052 2 9
J. Wilkinson, Queen Street, Withernsea ... 2,040 12 0
T. Ullathorne, Selby ... 2,030 12 6
J. T. Levitt ... 2,030 0 0
H. Sergeant, Withernsea, East Yorks ... 1,986 0 6
J. R. Woods ... 1,985 4 4
* Accepted. [Rest of Hull.]

CURRENT MARKET PRICES.

FORAGE.			
	£ s. d.	£ s. d.	
Beans	per qr. 1 10 0	—	
Clover, best	per load 4 15 0	5 10 0	
Hay, best	do. 5 5 0	5 12 6	
Sainfoin mixture ..	do. 4 10 0	5 5 0	
Straw	do. 1 8 0	2 0 0	

OILS AND PAINTS.

	£ s. d.	£ s. d.
Castor Oil, French ..	per cwt. 1 7 0	1 8 7
Colza Oil, English ..	do. 1 6 6	—
Copperas	per ton 2 0 0	—
Lard Oil	per cwt. 2 9 6	—
Lead, white, ground, carbonate do.	1 4 10	—
Do. red	do 1 0 4 1/2	—
Linseed Oil, barrels ..	do 1 10 3	—
Petroleum, American ..	per gal. 0 0 6 1/2	—
Do. Russian	do 0 0 5 1/2	0 0 6 3/4
Pitch	per barrel 0 7 0	—
Shellac, orange	per cwt. 5 17 0	—
Soda, crystals	per ton 3 2 6	3 5 0
Tallow, Home Melt ..	per cwt. 1 10 6	1 11 0
Tar, Stockholm	per barrel 1 2 6	—
Turpentine	per cwt. 1 12 0	—

METALS.

	£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton 71 0 0	—
Iron, Staffs, bar	do. 6 5 0	8 10 0
Do. Galvanised Corru- gated sheet	do. 12 0 0	12 7 6
Lead, pig, Soft Foreign ..	do. 11 13 9	11 15 0
Soda, do. English common brands	do. 11 18 9	—
Do. sheet, English 3lb per sq. ft. and upwards ..	do. 13 0 0	—
Do. pipe	do. 13 10 0	—
Nails, cut clasp, 3in. to 6in.	do. 9 0 0	—
Do. floor brads	do. 8 15 0	—
Steel, Staffs, Girders and Angles	do. 5 15 0	6 5 0
Do. do. Mild bars	do. 6 10 0	7 0 0
Tin, Foreign	do. 131 0 0	131 10 0
Do. English ingots	do. 132 0 0	132 10 0
Zinc, sheets, Silesian ..	do. 21 0 0	—
Do. do. Vieille Montaigne ..	do. 21 10 0	—
Do. Spelter	do. 17 15 0	18 0 0

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	£ s. d.	£ s. d.	
Fir, Dantzic and Memel ..	per load 2 1 0	—	
Pine, Quebec, Yellow ..	per load 4 7 6	6 0 0	
Do. Pitch	do. 2 14 0	3 11 0	
Laths, log, Dantzic	per fath. 4 10 0	5 10 10	
Do. Petersburg	per bundle 0 8	—	
Deals, Archangel 2nd & 1st per P. Std.	15 5 0	24 15 0	
Do. do. 4th & 3rd	do. 10 15 0	12 10 0	
Do. do. unsorted	do. 5 12 6	6 10 0	
Do. Riga	do. 6 15 0	8 10 0	
Do. Petersburg 1st Yellow ..	do. 17 10 0	—	
Do. do. 2nd	do. 8 10 0	13 15 0	
Do. do. White	do. 7 5 0	12 10 0	
Do. Swedish	do. 9 0 0	13 5 0	
Do. White Sea	do. 13 5 0	17 5 0	
Do. Quebec Pine, 1st	do. 24 0 0	27 5 0	
Do. do. 2nd	do. 12 0 0	21 5 0	
Do. do. 3rd & c.	do. 9 10 0	—	
Do. Canadian Spruce, 1st ..	do. 7 10 0	12 10 0	
Do. do. 3rd & 2nd	do. 7 5 0	9 15 0	
Do. New Brunswick	do. 7 5 0	8 0 0	
Battens, all kinds	do. 6 10 0	10 5 0	
Flooring Boards lin. prepared, 1st	per square 0 10 6	0 11 6	
Do. 2nd	do. 0 9 6	0 10 3	
Do. 3rd & c.	do. 0 8 9	0 9 0	

HARD WOODS.			
Ash, Quebec	per load 3 17 6	4 10 0	
Birch, Quebec	do. 3 12 6	3 17 6	
Box, Turkey	per ton 7 0 0	15 0 0	
Cedar, lin., Cuba	per ft. sup. 0 0 4 1/2	—	
Do. Honduras	do. 0 0 1 1/2	—	
Do. Tobasco	do. 0 0 5 1/2	—	
Elm, Quebec	per load 0 12 6	5 10 0	
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup. 0 0 4 1/2	—	

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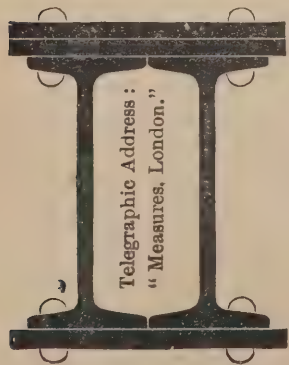
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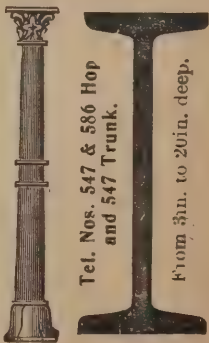
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The Coronation:
Stands and
Balconies.

THE terrible fatality at Glas-
gow has doubtless impressed
on the authorities the necessity
for the strictest regulations to

be observed with regard to the very large number
of stands erected for the Coronation. Since the
change in the government of the Metropolis, the
borough councils are now responsible for the
stands in their own particular districts; but the
safety of balconies rests with the Council. In view
of the fact that not a single accident occurred in
1897, when the Council was responsible for the
stands then erected, and that the Westminster
City Council has decided to engage four qualified
assistants to supervise the erection of wooden
stands in that district, there is no fear of any
laxity in assuring the safety of these structures:
but we would particularly urge that the Council
make every effort to prevent catastrophes caused
by defective balconies. On the procession days
all balconies commanding a view of the route
will be crowded, and many of them will not
have been used for some time: so that a
thorough inspection should be made to avoid
accidents like that which occurred at Man-
chester on the occasion of Lord Roberts's visit.
This is a very important matter demanding the
closest attention.

By the Side of
the Thames.

SURELY it is astonishing that
the London County Council's

Bill authorising the construc-
tion of an electric tramway along the Embank-
ment should only have been passed in the
House of Commons by a majority of nineteen!
Doubtless the opposition members followed pre-
cedent, for the proposal had already been
rejected nine times by the House: yet, when
the actual facts are considered, what a lot of
nonsense has been circulated about this new
tramway. While being thoroughly alive to any
attempt at "vandalism," we cannot side with
those persons who live in the past, utterly
neglect their own times, and consequently are
in a more or less chronic state of æsthetic fever.
Why should there not be tramways along the
Embankment? They will afford considerable
facility of communication between Blackfriars
and Westminster Bridges: and, as the conduit
system will be adopted, they will be quiet and
unobtrusive. Had the proposal been to adopt
the overhead system there would have been
some reason in opposing the scheme, for we do
not wish a repetition of the caging-in of streets
after the manner of the Chiswick High Road
and other branches of the same system. Certain
persons invariably oppose every innovation,

while others are so blinded by modernism that
they are equally unappreciative of the past.
Both extremes are wrong. Neither embraces a
generous view and the resultant can never be
so useful or effective as a thoroughly moderate
opinion. We can never expect any advance
from those who hug the past and neglect the
present, yet this is the class that has been
"æsthetically" raging about the Embankment
and its impending destruction by the tramways.
We are therefore glad that their aim has missed
its mark.

Warehouse Fires. If a large uninterrupted
window is demanded, plate
glass is the material exactly suited to require-
ments, and, provided the latter are just, there
can be no logical objection to plate glass so far

A Master of
Language.

SOME master-builders are won-
derful linguists, in which re-
spect they resemble barges

and offended cabmen. Their language, like the
atmosphere of the Underground, is sulphurous:
and, if report speaks truly, a certain master-
builder of Birmingham possesses this charac-
teristic in a most marked degree. A short time
ago he paid an early-morning visit to a house
which he was repairing in Edgbaston, and —
strange — found his men not laying so many
bricks as their friends at Manchester, and one
of them in particular so thorough in his respect
for the "ca' canny" doctrine that the irate em-
ployer spoke as a master-builder can, on occa-
sions, speak. Though an orator, his language was
hardly that of Demosthenes: indeed, it is hinted
that the foreman referred to the crumbling



CHIMNEY-PIECE FOR DR. H. O. TAYLOR. BREWILL & BAILY, ARCHITECTS.

as light is concerned, because it admits the
maximum amount in a given space. But the
question of fire in a building of the warehouse
class is even more important than that of light,
and, if need be, some sacrifices or compensations
must be made on its behalf. In large windows
glazed with one sheet in the ordinary way the
glass cracks the moment the flames strike it:
and thus the fire spreads. Hence, in the all-
important particular of fire-stoppage, the glass
fails. The recent disastrous fire in Barbican
exemplified this, and emphasises the necessity
to avoid large openings glazed in single sheets
and to adopt smaller panes, preferably of
wired glass: also, to use iron frames instead of
wooden ones, and, in special cases, to employ fire-
resisting shutters or blinds. It is becoming
increasingly evident that everything must be
done to prevent the spread of fire: to keep it
localised: and one way towards this end is to
abandon great windows in wooden frames glazed
with single sheets of ordinary plate glass.

effect of certain atmospheres on building
materials. However, the men were not shocked;
but the lady of the house overheard, without
knowing who was the speaker. The master of
the house, in righteous indignation, fiercely told
the foreman that no man should swear before
his wife and that he demanded the immediate
dismissal of the offender, whose presence could
not be tolerated on the premises: and the fore-
man, being a wit, suggested that if the good
lady would have preferred to swear first, doubt-
less the request would have been observed.
Matters had now become complicated, but a
happy solution was found by feigning to dismiss
a man—the master-builder's scapegoat: yet
what a moral lies here for builders!

The Chimney-piece illustrated above is an
addition to an old house, as will be seen by the
plaster cornice to the room. It is of deal painted
white, and the interior of the grate is built with
"Lethaby" green bricks, with Siena marble slips.

GEORGE'S DOCK SITE, LIVERPOOL.

THE LAYING-OUT OF THE NORTH SIDE.

AT the annual meeting of the Liverpool Architectural Society (Incorporated) held last week the following officers were appointed for the fifty-fifth session:—President, Mr. John Woolfall; vice-presidents, Messrs. T. E. Eccles, A.R.I.B.A., and P. C. Thicknesse; hon. secretaries, Messrs. Hastwell Grayson, A.R.I.B.A., and Gilbert Fraser, A.R.I.B.A.

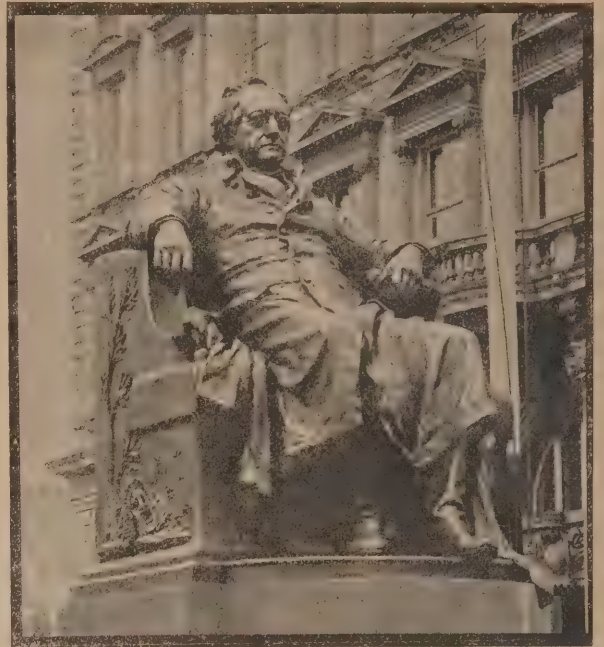
The chairman (Professor Simpson, the retiring president) invited a discussion on the laying-out of the north side of the George's Dock site, observing that he was sure they would all realise the importance of the matter. It was dealing with one of the most important sites in the city, and one that concerned everybody, but especially architects. Mr. W. E. Willink explained the proposal of the Council of the Society. The Corporation had already decided as to the nature of the buildings on the south and Gorie sides; and no objection was offered to these. In regard to the north side, however, the Council suggested that a block of buildings should here be erected which would be of a size sufficient to balance the Dock Board offices on the south side. To do this it would be necessary to cover more ground than was represented by the remaining portion of the old dock site, in the direction of the inclined way. Mr. Willink expressed the opinion that most of the traffic down Water Street and Brunswick Street to the Landing-stage would in future travel along the new extensions, so that any encroachment on the roadway at the north side would not interfere with the traffic.

The chairman announced that the Estate Committee of the Corporation had been written to, asking them to allow a deputation of the Society to lay the views of the members before them, and although no formal consent had yet been received he understood that the Committee were willing to receive the deputation. The opinion had been expressed that nothing should be built on the north side at all, and that it should be left absolutely open. The Council had carefully considered the matter, and had come to the conclusion that a big block such as the Dock Board offered on the south side, and a lofty block behind, with possibly a smaller block in front, would not look satisfactory, and that a dignified effect was more likely to be attained if a good-sized block were erected on the north side corresponding in size to the one on the other side.

After discussion, the following resolution was adopted: "That this meeting approves of the suggestion of the Council of the Society that the whole space, or as large as possible, be left open between the continuation of Water Street and Brunswick Street, and that a wide block be built on the north of this to balance the Dock Board offices." It was further resolved that Professor Simpson and Messrs. P. C. Thicknesse and Arnold Thornely constitute a deputation to wait upon the Estate Committee of the Corporation.

On Saturday, April 19th, the members of the Society paid a visit to Hawarden. Mr. Minshull met the party at the station, and conducted them to the new Gladstone Memorial Library, now being erected from designs by the firm of Douglas & Minshull, of Chester. The building is Gothic in design, richly carved and moulded. It is built of Runcorn and Helsby stone, and roofed with green Coniston slates. In accordance with Mr. Gladstone's own wishes, the library proper is divided into two parts—the larger to contain the books on humanity, and the smaller those on divinity. Each room is two storeys in height, with an open carved oak gallery and an oak roof. In addition there are rooms for the staff and for special study, and a residential wing will be added eventually. The books will be arranged on the same principle as those arranged by Mr. Gladstone in the temporary iron building adjoining. The members of the Society were much struck by the great economy of space afforded by the design of the bookcases. Visits were afterwards paid to Hawarden Church, where a vaulted side chapel is in course of erection, and to a new church at Shotton, designed by Messrs. Douglas & Minshull, and erected to meet the wants of that growing mining district.

The Embankment Lamps at Highgate.—The London County Council have adopted the dolphin lamp on the Embankment (by Vulliamy) for the new Highgate Archway!



STATUE OF GOETHE IN VIENNA. PROFESSOR HELLMER, SCULPTOR.

TWO GERMAN STATUES IN VIENNA.

BY ALFRED W. FRED (Vienna).

MONUMENTAL art has undergone great changes during the last few years. The old style had lately acquired the appearance of model work. Until very recently no man had dared to give an individual expression to a head and to impress it with a fresh, characteristic inspiration—even in France, the land of the plastic, a work like Rodin's "Balzac" had to encounter a storm of objections a few years ago. The two monuments that have been added to Vienna during the past year give a good idea of the development of monumental art. By far the more striking of the two is that of Goethe, by Professor Hellmer, of Vienna. This work shows forth the confident, enlightened thinker, far ahead of his time: for all ages a marvellous representation of universality; the restless, creative poetic genius. One can see in it the idea on which the sculptor laid particular stress. There are the comfortably-placed well-shapen free limbs, the control of the fine hands, and the Olympian equanimity of expression. The architectural portion of the monument is simple, all interest being concentrated in the figure itself. The monument is cast in yellow bronze, and is much larger than life-size.

Much less simple, and therefore less effective, rather fanciful than artistic, is the other new Vienna monument of Gutenberg, the inventor of the art of printing. It is by Hans Bitterlich who was the prize-winner in the competition held. Gutenberg, patrician of Nuremberg, as is known, is represented in the garb of his time, one leg placed forward, with one hand set in his side and the other resting on a chair. The left foot, without apparent object, projects over the base. The first sketch showed, instead of the chair, a hand printing-press, which was a good symbol. This monument also is cast in bronze and is more than 3 metres high. The artist has sought to represent Gutenberg as a thin grief-stricken man. This characteristic representation strikes me as at least superfluous. What one misses is any artistic and direct hint as to the reason why he should, after a lapse of 500 years, have a monument. Even the reliefs on the pedestal, which is of granite below and light yellow marble above, have no intimate connection with Gutenberg. The inscription and some descriptive matter are very necessary to enlighten the curious beholder. The effect of the monument from a distance is, however, praiseworthy.



STATUE OF GUTENBERG IN VIENNA. HANS BITTERLICH, SCULPTOR.

SOME ANCIENT HAMPSHIRE PALACES.*

By S. W. KERSHAW, M.A.

FROM the title of this paper more perhaps may be expected than can be gathered even from treasured archives or from what remains of these once important manor-houses of the see of Winchester; for, with the exception of Wolvesey Castle, at Winchester, the other buildings are but fragments.

Winchester was early of architectural importance, and we read, "Under Alfred's fostering care Winchester became the home of all the learning and the arts known in that day, and rivalled the earlier splendour of the court of Charles the Great at Aix-la-Chapelle." The artistic activity of Winchester was also seen in the foundation of Hyde Abbey near the city, where some of the choicest examples of illuminated manuscripts were produced. Later, we find this mediæval city the focus of trade and industry, and in Winton Domesday the names of the chief citizens, the franchise and the liberties of this powerful city are recorded. It was also a royal residence. An attempt was made by Charles II. to revive the ancient glories, for he determined to build there a palace which should rival the splendour of Versailles, and commissioned Sir Christopher Wren to secure a site which would have commanded a stately approach to the cathedral—fair terraces and steps were to lead thither—and a very royal structure would have risen had not the king's death in 1685 arrested the whole design. The house was never inhabited, and was afterwards used as barracks till a great part was lately destroyed by fire.

In addition to the architectural history of Winchester and Hampshire, when we consider its prelate-builders a review of their lives and works cannot but form a chapter in our studies. From the first Norman bishop, Walkelin, in 1079, who rebuilt the cathedral; Bishop Henry of Blois, to whom the castles of Farnham, Wolvesey, Merton and others owe their origin; to the famous William of Wykeham, followed by Bishop Waynflete, and, after the Commonwealth period, by Morley, the restorer of Wolvesey and Farnham; a series of illustrious craftsmen is presented to our notice whose influence reached even to the small village churches.

Wolvesey.

When William of Wykeham was bishop there were ten or twelve different castles, manor-houses and places of residence in Hampshire. Of these Wolvesey claims the first rank. Dean Kitchin says: "At Wolvesey Castle, with the help of the brethren of St. Swithin's Convent, the earlier part of the Anglo-Saxon Chronicle was compiled and copied." In the twelfth century we may fix the foundation of Wolvesey as the "palace" with "a very strong tower" built by Henry de Blois, the architect-bishop who erected portions of Farnham Castle. Leland calls Wolvesey "a castle or palace well fortified, and the old walls extended almost to the city bridge, being fortified with towers at proper distances," a statement endorsed by Camden, who wrote: "It was very spacious and surrounded with many towers." One famous name, William of Wykeham, is prominent as having repaired Wolvesey, and from having lived there in much splendour. Called from his native place, Wickham, near Fareham, in Hants, he was pre-eminently an architect-prelate, having built Queenboro' Castle in the Isle of Sheppey and Winchester College, while his work at Winchester Cathedral and other places would alone signalize his skill. It does not appear that his architectural knowledge developed before his twenty-third year, when he was in King Edward III.'s service and made clerk of all the royal manors, and the patent for that office was conferred on him in May, 1356, followed by the surveyorship of the king's works at Windsor. Wykeham rose more and more in favour—"Everything," says Froissart, "was done by him, and nothing was done without him." In 1368 he was enthroned Bishop of Winchester, and, as such, speedily issued orders to have all the castles, manor-houses and palaces belonging to the see

repaired. The Hospital of St. Cross, near Winchester was restored by this prelate. His great work, the founding of New College, Oxford, was accomplished in 1380, and the building was finished in six years. That Winchester might be connected in learning with Oxford, this princely prelate founded that famous college in his cathedral-city. In his seventieth year he began the greatest of his works in Winchester Cathedral. He rebuilt the nave, and engrafted the elegant Gothic on the earlier work, still retaining the strength and outline of the solid masonry. The picture gallery at Farnham Castle has a fine portrait of him. Wykeham was succeeded by William Waynflete, who was educated at Winchester and Oxford, and founded Magdalene College in that city. In 1438 he was made master of St. Mary Magdalene Hospital, in Winchester, and Henry VI. afterwards made him master of Eton. Much intercourse took place between the college authorities and Waynflete as to architectural matters, the former visiting the bishop four times a year, accompanied by the chief mason, the carpenter, and Walter the carver. "The Bishop to supply all materials, pay for all

have been attributed, without evidence, to Albert Direr.

The Civil Wars raged fiercely in Hampshire, and the old palace of Wolvesey was destroyed, or nought left but a few walls. The ancient castle near the entrance to the city was also dismantled in that dire siege, which devastated the country all around Winchester. With the Restoration a new era dawned. Bishop Morley was then the prelate of St. Swithin's See. He began rebuilding the structure, and employed Sir Christopher Wren for that purpose. Bishop Morley is also known as having repaired Farnham Castle, and he rebuilt the present chapel of that historic pile. The last to improve Wolvesey was Bishop Trelawney (1707-21), who added one of the wings and made many internal alterations.

Bishop's Waltham.

Of this palace, Leland wrote: "Here the Bishop of Winchester has a right ample and goodly manor-house, moated about, and a pretty brook running hard by it." The palace was built by Henry de Blois; succeeding prelates added to or improved the house, especially



STABLE, "OAK LEA," NEAR LEEDS. BEDFORD AND KITSON, ARCHITECTS.

labourers, and to provide lodging for the said Water and all his servants." Though Waynflete's share in the Eton buildings was great, Professor Willis remarks that his work was confined to the church.

At Esher are the remains of Wolsey's Tower (or gatehouse) of the palace built for that Cardinal by Bishop Waynflete—"the stately mansion of brick"—between the years 1450-80, a building which in Wolsey's time must have recalled a small portion of Hampton Court: nought but the picturesque tower overlooking the River Mole now remains. In the eighteenth century great changes were made to Esher Place by Kent, the architect of the Horse Guards, in re-modelling, insertion of windows, &c., and this took place during the tenure of Henry Pelham, the statesman; after his death the house was pulled down.

Another prelate, Bishop Fox, lived much at Wolvesey, and is commemorated by his exquisite chantry tomb in Winchester nave, as well as by the erection of the famous altar-screen in St. Saviour's, Southwark, near the once standing Winchester House, the London home of the bishop of that see. The roof of the present choir of Winchester is attributed to this prelate, and was decorated by him about the year 1502. As one of the executors of Henry VII. and Lady Margaret, he had much to do with the building of St. John's College, Cambridge; also King's College in that university. The designs of the stained glass in King's College Chapel are attributed to Bishop Fox, by the direction of Henry VIII., in 1515. By some the windows

William of Wykeham. To this day the great hall can be traced, its five large windows shrouded in ivy, together with a ruined tower adjoining. The building did not escape the Civil War period; in March, 1644, preparations for an assault were made, terms of surrender were agreed on, but in a few months afterwards the palace was almost a ruin.

Bishop's Waltham Church, in the neighbourhood, claims a word as having had in some part of its design the work of Bishop Blois and of William of Wykeham in the chancel, the east window of which has his well known badge of the rose, seen also in the church at Meonstoke in Hampshire.

Merton.

Merton, four miles south-west of Winchester, was an occasional residence of the Bishops of Winchester, built and fortified by Henry of Blois circa 1138—all that is now left are a deep wall and some ruins in Hursley Park.

A fragment only of a flint tower remains of the whole structure; the castle was in ruins in the fifteenth century. It was built on an island of chalk down, shut in by trees. The fragment still standing is believed to be part of the northern gateway tower, and the entrance would have been by a drawbridge.

Another manor was Highclere, alienated from the see of Winchester in 1551 by Bishop Poyntet.

In connection with my subject I may mention the churches of East and West Meon, well known to most architects for their Norman work. East Meon was one of the bishops' manor-

* Summary of a paper read before the Society of Architects on Thursday, April 24th, 1902.



"WEETWOOD CROFT," NEAR LEEDS: SOUTH FRONT. BEDFORD AND KITSON, ARCHITECTS.

houses, and the remains (now a farmhouse) may be seen opposite the church gate. The brick walls and arches of this once former palace are still standing.

Farnham.

Farnham Castle, though on the Hampshire border, may surely be included in the list of ancient palaces, especially as the seat of the see and diocese of Winchester, and can therefore form an appropriate close to this paper. Of the original fortress, built in 1136, by Henry de Blois, little remains save the keep and the servants' hall with its circular pillars, formerly the castle chapel. We need but recall the siege of Basinghouse, not so far distant to learn what havoc war was making in this district. This famous fortress stood a siege of four years, and but a few fragments of the old house remain—the gateway, ivy-covered walls and terraces overgrown with brushwood. After the Restoration Farnham Castle entered on its renewed life, repaired and improved by Bishop Morley, who held the see of Winchester from 1662-84. The bishop had largely given to the repair of Winchester Cathedral and to his palace at Wolvesey; but he laid out £8,000 on Farnham, and annexed Winchester House, Chelsea, to the diocese as the town residence for the bishops. The present private chapel erected by this prelate has some interesting features. The wealth of carving by Grinling Gibbons cannot escape notice. The entrance porch of the castle,

of red brick, was built by Bishop Fox, and is known as Fox's Tower, embattled with octagonal turrets. Over the entrance of this tower is a sun-dial with the motto: *Imputantur prætereunt.*

"Weetwood Croft" and "Oak Lea."—A ground plan of "Weetwood Croft," near Leeds, was published in our issue for June 21st, 1899, in which issue also appeared a perspective, reproduced from a pencil drawing by Mr. C. E. Mallows, F.R.I.B.A. Another perspective drawing by Mr. F. L. Griggs was also illustrated in our issue for May 25th, 1898. The house is built entirely of local stone, and the roof was intended to be covered with stone slabs, but by the owner's wish red tiles were used instead. The parapet of the porch is carved with vine, grapes, birds, and butterflies; the knots under it are carved with different flowers, and on the sundial are carved wild roses and the motto "True as the Sun." All the principal rooms have oak floors and the hall is panelled to door height. Mr. Francis W. Bedford, F.R.I.B.A., was the architect.—"Oak Lea" is a small stable designed by Messrs. Francis W. Bedford, F.R.I.B.A., and Sydney D. Kitson, M.A., of Greek Street Chambers, Leeds, for Mr. S. M. Bryde. It has a coach-house, harness-room, one stall, and one loose-box on the ground floor, with loft over. It is built of local stone with red-tiled roof. It was erected in 1898.



"WEETWOOD CROFT," NEAR LEEDS: VIEW FROM THE SOUTH-WEST.

METALLURGY & ENGINEERING.

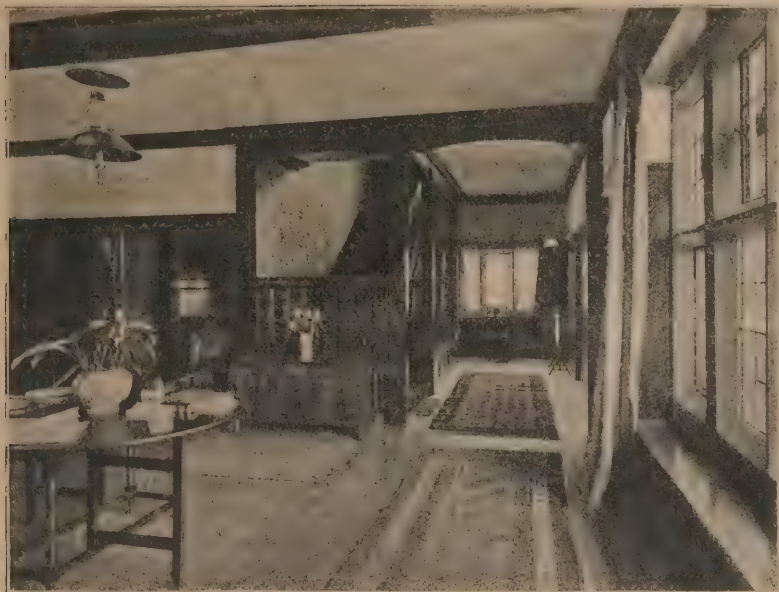
THE ARCHITECT-ENGINEER.

BY SIR WILLIAM ROBERTS-AUSTEN,
K.C.B., F.R.S.

AT a special meeting of the Institution of Civil Engineers held on April 23rd the tenth "James Forrest" lecture was delivered by Sir William Roberts-Austen, K.C.B., F.R.S., Hon. M.Inst.C.E., the subject being "The Relations between Metallurgy and Engineering." The lecturer quoted Mr. G. P. Bidder, who, in his presidential address to the Institution delivered in 1860, said "that if he were called upon to define the object and scope of the profession of civil engineer, he would say that it was 'to take up the results discovered by the abstract men of science and to apply them practically for the commercial advantage of the world at large, and to diffuse their beneficent influence among all classes of his fellow citizens.'" He hoped to be able to show that metallurgists practising an industrial art had helped the engineer to do this, and in evidence that such was the case he quoted from the presidential address of Sir John Fowler words to the effect that engineers had been more assisted by members of the Institution and by distinguished men of science generally in relation to iron and steel than as regarded any other material. The relations with which the lecture dealt had been strangely stimulated by the intervention of men who, in many cases, were neither engineers nor metallurgists, but were men whose lives had been devoted to abstract science. Such men recognised the value of certain metals and alloys for definite uses, they investigated their mechanical properties, and proclaimed their merits to engineers. The intervener then disappeared, leaving behind some coefficient or constant bearing his name by which he was gratefully remembered. As an instance, Galileo's estimation of the tensile strength of copper cylinders and Young's determination of the rigidity of steel (which had resulted in Young's modulus) were cited.

It was not easy to fix the period in industrial history at which the metallurgist began to give the engineer material assistance. If in this country Stonehenge were taken as a starting point, the architect-engineer who designed that crowning example of neolithic art could not have received any assistance from the metallurgist. That stately structure arose from the plain at a time when bronze tools were known but were not in general use, and this period had recently been fixed by Mr. Gowland at about 2,000 B.C. In another phase of engineering work it was known that Rome, in the days of her occupation of this country, trusted to the metallurgists of our island to supply the lead which was so extensively used in the Eternal City. The fourth-century wrought-iron column discovered in India, and the girders and beams of the Orissa temples, rendered it necessary to exercise great caution as to the period at which iron was used in construction. Such magnificent efforts as those given were, however, not maintained, and no widespread or continuous records of the metallurgists' contributions to early constructive work could be presented. On the other hand, the civil engineer had, to quote the Charter of the Institution, "advanced mechanical science and directed the great sources of power in Nature for the use and convenience of man" for ages before the metallurgists rendered more than incidental service.

As examples of great engineering works into the construction of which no metal entered the lecturer referred to and gave illustrations of the primitive cantilever bridges of pine trees used to cross mountain torrents in Savoy. The interesting thirteenth-century cantilever bridge made up of 20ft. beams given in the note-book of Villars de Honnecourt was also shown, as was a bascule bridge of the Middle Ages. The dome of Milan Cathedral, as designed by Leonardo da Vinci, the great Tuscan painter, engineer and architect, was also referred to as an example of a structure in which metal was not used. The employment of cast-iron from the time of Queen Elizabeth to the present day was then dealt with, and the proposed cast-iron bridge of 600ft. single span by Telford and Douglas was



"WEETWOOD CROFT," NEAR LEEDS: HALL AND STAIRCASE.

referred to, and it was pointed out that in the nineteenth century metallurgists, by creating the age of steel, more than atoned for their somewhat tardy and intermittent efforts to supply engineers with suitable materials.

As regarded the use of cast-iron and malleable iron, it was admitted that the necessity for pumping water out of mines was the main factor in the evolution of the steam-engine, and, in turn, the development of British metallurgy of iron and steel dated from the time when the steam-engine of Watt enabled air to be readily pumped into the blast-furnace employed for the production of cast-iron. It was then pointed out that more than half of the last century had elapsed before the "age of steel" began, and that towards the end of the century great attention was devoted to considerations connected with the molecular structure and properties of steel, and to enforcing the action of carbon—the element which gave steel its properties—by the addition of other elements than carbon in very small proportions. With regard to the slow growth of confidence in the qualities of steel, the opinion of successive presidents of the Institution, as expressed in their addresses, was quoted; in 1887, when Sir George Bruce delivered his address, the merits of steel had at last received recognition, and as regards the crowning triumph of the age of steel—the Forth Bridge—Sir George exultingly exclaimed: "At the Menai Bridge the total quantity of iron was 11,468 tons; at the Forth Bridge there will be 50,000 tons of steel and iron." No one had done more than Sir Benjamin Baker to insist on the importance of phenomena which engineers used to consider "mysterious" in connection with the behaviour of steel, and his warnings and example were at last being regarded and followed. The lecturer pointed out that when metallurgists gave engineers mild steel they provided a cinder-free solid solution of iron and carbon. All subsequent advance had been due to the recognition of this fact and to the gradual study of the properties of metallic solid solutions. Sir John Hawkshaw, in his presidential address to the Institution delivered in 1862, had said that if the strength of iron could be doubled the advantages might be equal to the discovery of a new metal more valuable than iron had ever been. The lecturer contended that this was exactly what metallurgists had done with regard to steel.

In conclusion, he appealed to the new Alexander III. Bridge at Paris as showing the need for the careful measurement of high temperatures in connection with the treatment of large masses of steel. In the construction of the bridge 2,200 tons of cast steel had been employed and a peculiar molecular structure was imparted to the steel by rapidly cooling it in air from a temperature of 1,000° C. to 600° C.; this gave the metal certain mechanical properties which it would not otherwise have possessed.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

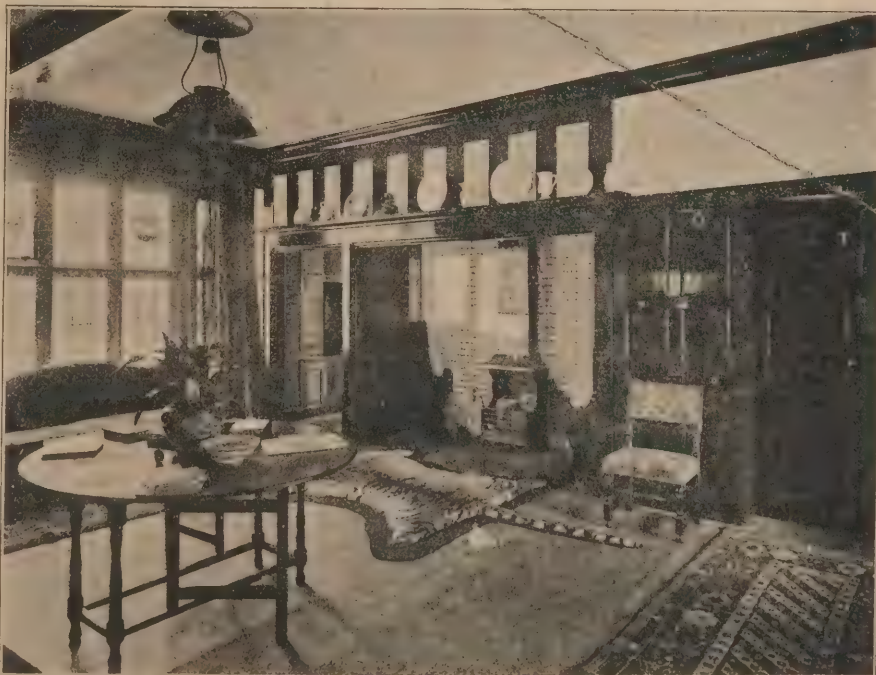
REFERENCE is made in the annual report for the past year to the new draft by-laws of the Leeds Corporation. These were considered by the Society and various alterations suggested, but the authorities were not disposed to consider them or to grant an extension of time in which the Society might discuss the by-laws. When the Local Government Board inspector appears in Leeds to hear objections the Society will give evidence in support of their views.—The Council objected to the assessor for the new baths at Bramley and York Road, Leeds, nominated by the Leeds city authorities, on the ground that the assessor in such a competition should be an expert in the design and construction of baths. They also named some architects who would meet with their approval if appointed to the post. The assessor, though verbally expressing his willingness to refer the matter to the Leeds Town Clerk, refused to withdraw from his appointment and awarded the premiums. The Council then laid the correspondence with the assessor before the Council of the R.I.B.A., asking them to endorse their action. This the Institute refused to do, stating that they considered it

sufficient that an architect on being appointed an assessor in any competition should make such enquiries as would qualify him to judge of the merits of the designs submitted, whether he were a specialist in the particular kind of building to be erected or not. The Council of the Society wrote to the Institute saying that they could not agree with them in their decision.—During the year the Society's first Green Book, compiled and edited by the president for the year, was published.

GLASGOW INSTITUTE OF ARCHITECTS.

THE annual report of the Council for the session 1901-2 refers to the alteration made in the rules to bring the electoral year more into line with that of the R.I.B.A. The annual meeting has been changed from the third Tuesday in October to the third Tuesday in April: so that the present report really only deals with a half-year session. The members now on the roll number seventy-two. The Photographic Collection Committee have completed the set of architectural photographs brought together in connection with the Glasgow Exhibition, illustrating the architecture of Glasgow from the cathedral down to buildings of the most recent times. The total expense is not expected to exceed £20. The photographs may form the nucleus of a larger collection, in which all the works of architectural interest in Glasgow and the West of Scotland will be included. Space has been provided for such an extension, and members and other architects are invited to present photographs of buildings erected from their designs and coming within the category mentioned. The offer of such contributions should, in the first place, be intimated, with information regarding the building illustrated, to the secretary for submission to and approval by the Council. Photographs should be printed and mounted in conformity with those in the collection already formed. The ninth triennial competition for the Alexander Thomson Travelling Studentship is to be held this year, the drawings to be lodged with the secretary by December 26th, and the Council are glad to report that the individual applications for copies of the programme have far exceeded their expectation, based on former competitions, as these already number upwards of seventy and have come from all parts of the Kingdom. The Council regret they have nothing to add to the statement in their last report with regard to the Glasgow Royal Infirmary competition. The revenue account shows a balance in hand of £10 13s. 9d.

In St. Olave Church, Exeter, new oak chancel and parclose screens have been erected by Messrs. Harry Hems & Sons, of Exeter.



"WEETWOOD CROFT," NEAR LEEDS: FIREPLACE IN HALL.

SOCIETY OF ARCHITECTS.

ANNUAL DINNER.

THE eighteenth annual dinner of the Society of Architects was held on Friday evening last in the banqueting hall of Princes' Restaurant, Piccadilly, W., the president, Mr. Silvanus Trevail, F.R.I.B.A., J.P., presiding. The company numbered about 150, and included Alderman Sir William Treloar, Lord Monkswell, Sir William Richmond, K.C.B., R.A., the Bishop of Southwark, Archdeacon Sinclair, the Hon. W. F. Massey-Mainwaring, M.P., Sir Wyke Bayliss, F.S.A., Mr. T. P. O'Connor, M.P., Mr. Edward Terry, Mr. Alfred Darbyshire, the mayors of several London boroughs, the presidents of various associations, and managers of large railway and shipping concerns. After the royal toasts had been given, Sir William Richmond proposed the toast to "Ministers of Religion," in doing which he referred to the fact that in the past the ministers of religion had also been the ministers of art: it had been so in Egypt, where, under the Theban dynasties, the priests had regulated the artists. The practice had been followed in later times, but, happily, we were now free of it, and it behoved ministers of religion, instead of embarking into periods out of our cognizance, to identify themselves with the leading artistic movements of their time. In these days we could not repeat the methods of popes who impoverished the people to build a new Rome, and we needed to diminish the excrescences on our buildings and meet the demands of the church by simplicity and proportion. It was not the slightest use to hark back. We had to construct in iron and steel, and the greatest architects would be those who best conformed to the requirements of the day. The Bishop of Southwark and Archdeacon Sinclair responded. The latter said that there had always been the greatest harmony between the authorities of St. Paul's Cathedral and Sir William Richmond in regard to the decorations. He mentioned the proposal to rebuild the parish church of Islington, plans for which had been prepared by Mr. Reginald Blomfield. These would cost £30,000 to execute, but, for financial reasons, the amount had to be cut down to £20,000. He regretted this and had done his utmost to prevent it, and in this connection he pointed out that it was not absolutely necessary for one generation to build the whole of a church in a year—it was better to have a really good plan and build as much of it as we could. In conclusion he said that it had always been a dream of his that Wren's earlier design for St. Paul's should be carried out somewhere. As could be seen from the model they possessed, it was a more beautiful design than the existing building, and Wren abandoned it under compulsion with great regret.

The next toast was that of "The Houses of Parliament," proposed by Mr. Frank Dodd, barrister-at-law, and responded to by Lord Monkswell, Mr. Massey-Mainwaring and Mr. Edward Hain. Mr. Massey-Mainwaring observed that, though the Houses of Parliament were so beautiful outside, the ventilation and sanitary arrangements were most imperfect.

The toast of "The Imperial Forces of the Empire" was next given, proposed by Mr. W. A. McArthur, M.P., and responded to by Major-General Hamley, C.B., and Colonel F. J. Hext, R.G.A. Mr. T. P. O'Connor, M.P., then proposed "The London Authorities," whose great work was, in his opinion, the breaking down of that isolation of individuals characteristic of great cities like London. In the course of his speech he jocularly observed with regard to the several mayors present that he expected to be in the company of free-born Englishmen; yet he found himself in the midst of men in chains! Alderman Sir William Treloar, Mr. G. L. Gomme (clerk to the London County Council), Mr. E. Barnes, J.P. (Mayor of St. Pancras) and Dr. James White (Mayor of Lambeth) responded.

Sir Wyke Bayliss proposed the toast of the evening—"The Society of Architects and Architecture." "Architecture," he said, should be under the control of architects and not of painters. Each saw with different eyes and thought with different thoughts. The painter saw in the plane, with two dimensions: the architect saw

in the round, with three dimensions. Neither the Parthenon nor Westminster Abbey was conceived by a painter, and it was not for either to trespass on the other. Whilst looking over a portfolio of his (the speaker's) sketches of Italian churches the late Cardinal Manning admitted that there was beauty in all of them, but his heart was not stirred till he came to St. Peter's, Rome. Two things were there—a great circle and a great arch above; but that was enough. He admitted that at Westminster there was beauty in part, but at St. Peter's you saw it at once, all, and for ever. It was the *idea* that lifted architecture to the level of a fine art. The president and Mr. Alfred Darbyshire responded. Other toasts were "The Arts and Crafts allied to Architecture" and "The Visitors." In proposing the latter Mr. Walter W. Thomas, referring to the Liverpool Cathedral question, suggested that the model of Wren's earlier St. Paul's might be sent down to Liverpool for consideration with the other designs.

Engineering Notes.

A New Subway at Clapham Junction has been opened by the London and South-Western Railway Company for passengers.

The Scheme of further Ventilating the House of Commons has been begun. A hole has been made in the roof by removing one of the sloping panels over the Strangers' Gallery, and an electrically-worked fan will be fixed there.

A New Telegraph Recording Instrument.—The Typewriting Telegraph Corporation, Ltd., of 303-5, Dashwood House, New Broad Street, E.C., are the proprietors of Stelje's Telegraph Recording Instrument. Its chief features are that no batteries are required. (The necessary current being obtained from a magneto driven by hand or power) and that it automatically records messages being sent.

Underground Tramways.—Last week a Committee of the House of Commons had under consideration the London County Council Subways and Improvements Bill. The proposal was to construct a tramway, worked by electricity, commencing at Theobalds Road, where it would form a junction with an existing tramway, now the property of the London County Council, though it is not worked by them. Thence it would fall in level until in Southampton Row it would be below the level of the street, and it would then, in a shallow subway, pass along the site of the supposed new street from Southampton Row to the Strand until it met the crescent near the Strand, which the Council have power already under an Act of 1899 to construct. There it would turn towards the Embankment, on reaching which, near Waterloo Bridge, it would come out on the level. The tramway is an attempt to deal with the problem of the congestion of the streets. At no distant date the London County Council will be able to work the whole of the tramways in London by electricity. Mr. Alfred Baker, manager of the tramways worked by the London County Council, described the system of tramways in Boston, America, very similar to that now proposed, the results being most satisfactory. Mr. Fitzmaurice, chief engineer to the London County Council; Mr. Joseph Baker, vice-chairman of the Highways Committee of the London County Council; and Mr. J. H. Ryder, electrical engineer to the Council; gave evidence. The Committee passed the preamble of the Bill.

Mr. William Stirling, architect, late of York Buildings, Adelphi, has committed suicide at the age of forty-one years. Mr. George Cawthorn, estate agent, of the same address, said at the inquest that Mr. Stirling lived the life of a recluse. Not having seen him for fourteen days, witness on Thursday last called in the police, and they found him lying on the floor in a pool of blood, from wounds in the throat self-inflicted by a razor. Mr. William Kingross Arber, solicitor, stated that Mr. Stirling was his second cousin. He was an exceedingly clever architect, but a disappointed man, not having met with the success he merited. He had no desire to associate with his fellow-creatures at all. His father died from softening of the brain. Mr. Stirling was Assistant Professor of Architecture at University College, London.

Builders' Notes.

British Fire-Prevention Committee.—Publication No. 65 describes and illustrates the new testing station at 66, Porchester Road, Westbourne Park, W.

The Plumbers' Company will present Mr. Andrew Carnegie with the honorary freedom at the Guildhall on Wednesday, May 14th, in recognition of his munificent gifts for the promotion of education amongst all classes of the community.

Mr. William Wilson, builder, of Edge Hill, Liverpool, died recently at the age of sixty-seven years. He was a native of Milnthorpe, Westmorland. When a young man he went to Liverpool, and commenced operations as a master-builder, soon acquiring a wide connection. He executed a number of important contracts.

The Builders' Clerks' Benevolent Institution held its twenty-fourth annual dinner at the Holborn Restaurant last week. Mr. F. L. Dove, president, occupied the chair. Mr. E. Brooks, treasurer, stated that when the first report was issued they had £638 invested, whereas that item in the accounts was now £7,000. They used to give pensions of £20 a year to the men and of £15 to the widows; and the amounts were now £30 and £24 respectively. Mr. J. Austin, the secretary, announced subscriptions and donations to the amount of over £300.

The Building Trade in Portsmouth.—At a recent meeting of the Portsmouth Trades' Council attention was called to the depression in the building trade, and it was asserted that there were many workmen who had not been able to get a fortnight's work since Christmas. Distress was rife, and relief was much needed, and it was suggested that grants to the needy might well be made out of the accumulating surplus of about £600 raised about eight years ago, when distress in the winter was very acute. Several members gave personal testimony as to the serious character of the distress, and it was decided that the Mayor should be approached on the matter with regard to the formation of a relief fund or to the making of grants from the fund. The Eastney and North End districts appear to be untouched by the depression, and this is easily accounted for by the fact that building there is constant and regular, North End being especially busy just now with new churches, and the builders have their full staffs at work. If it were found necessary to distribute the fund, the Mayor said it would be necessary to see that only the artisans who had actually belonged to the town, or had been resident in it for some years, should participate.

London County Council.—At last week's meeting of the Council the Parliamentary Committee reported that there were twenty-six Bills before Parliament dealing with "tube" railways in London, and up to the present time fourteen of them had been referred to a Lords Committee. The Highways Committee urged the necessity of some specially-constituted body being established to which new schemes for the provision of means of transit in London might be referred, in order to secure uniformity and systematic action in the matter. It was to be borne in mind that the question of locomotion was closely connected with the provision of housing accommodation, the control of the increasingly congested traffic of London, and other important problems, and this fact made it the more essential that a special authority should be entrusted with the duty of dealing with the transit question in London. After discussion the subject dropped.—Dr. Longstaff, as chairman of the Building Act Committee, said with regard to the Hackney fire, in which the construction of the building was such as to prevent the use of fire-escapes, that the Fire Brigade Committee might obtain some suggestions as to buildings which could be of use to the Building Act Committee. Something might then be done by imposing conditions as to the way in which alterations and additions were made to existing structures.

Mr. Christopher Harston, F.R.I.B.A. (of the firm of A. & C. Harston, architects, of London), has been appointed a justice of the peace of the county of Kent for the Dartford Division.

ARCHITECTURAL ASSOCIATION.

ARBITRATIONS.

By E. A. GRUNING.

A MEETING of the Architectural Association was held last Friday, Mr. G. B. Carvill, vice-president, in the chair. Mr. H. A. Hall was elected a member of the Association, and the following additional donations to the New Premises Fund were then announced:—

	£	s.	d.
W. H. Lever	-	-	25 0 0
W. Henry White	-	-	10 10 0
C. de Gruchy	-	-	5 5 0
H. E. Rider	-	-	5 5 0
L. Jacob	-	-	3 3 0
E. J. Stubbs	-	-	2 2 0
Francis R. Taylor	-	-	2 2 0
A. C. Dickie	-	-	1 1 0
T. T. G. Donaldson-Selby	-	-	1 1 0
V. A. Flower	-	-	1 1 0
H. W. H. Palmer	-	-	1 1 0
W. M. Paton	-	-	1 1 0
H. O. Trimmell	-	-	1 1 0
Horace White	-	-	1 1 0
C. H. Strange	-	-	1 1 0
G. Vernon	-	-	1 1 0
A. T. Griffith	-	-	1 0 0

Donations previously announced 4,063 8 6

Total £4,127 4 6

Mr. E. A. Gruning then read his paper on "Arbitrations," of which the following is a summary:—

I propose to speak simply on arbitrations from the architect's point of view, and to confine myself entirely to such as may occur in the ordinary practice of an architect. I propose also not to go too deeply into the question of precedents, or of law. In fact, as far as possible, to base my remarks on the knowledge I have personally gained in active practice.

Arbitration was really the earliest species of law. In primeval times the king or head of a tribe was the arbitrator, both in civil and criminal cases. In course of time, law superseded arbitration, but a reaction set in, by which arbitration has become more than formerly a recognised means of settling disputes, being now invested with legal powers, which until recently did not exist.

Although many arbitrations had taken place under agreements, the beginning of this change arose with the legislation of the Law Procedure Act of 1854. But the Arbitration Act of 1889 did more than anything to put arbitrations on a proper basis, and to invest them with a dignity and importance which till then they had not possessed. Without going into the detailed provisions of this Act, it may be said that the arbitrator has all the powers of a judge of the High Court, except the power of committal to prison for contempt of court. His proceedings are as strictly defined as those of the courts, and he cannot be deposed except for misconduct or corruption.

The object of arbitration is, or should be, to simplify the decision of disputes. The arbitrator should be an expert in the matter which he has to decide, the object being to avoid waste of time in informing him of the customs of professions and trades, and bringing evidence necessary to prove such matters, which he should, of his own knowledge, be able to decide upon without any such evidence. Arbitrations, too, should not, if before a lay arbitrator, be allowed to involve questions of law. These, if they do arise, are better dealt with direct by the proper courts, though I shall afterwards show how an arbitrator can deal with them in case of need.

There are three classes of arbitration—first, with two arbitrators and an umpire, the decision of the umpire alone being final; secondly, where the decision of the umpire in conjunction with one of the arbitrators is necessary; thirdly, where there is a sole arbitrator. With regard to the first, excepting the cases to which we shall refer hereafter, it is desirable to avoid having two arbitrators and an umpire, unless the arbitrators conduct the case on behalf of their respective clients. This is not so if counsel or solicitors are employed, and in such a case the two arbitrators merely sitting with the umpire are practically more ornamental than useful. Under the second head there is only one class of arbitration, namely, that of

party walls, under the Metropolitan Building Act of 1894. Here it is necessary that two of the three surveyors should sign the award. Under the third head, where there is a sole arbitrator, this is, in many respects, the best method of arriving at a rapid decision on the points in dispute.

The matters which come to the arbitration of an architect or surveyor can be classed as follows:—

Party walls under the London Building Act of 1894; dangerous structures; questions arising out of the various factory Acts and amendments thereto; questions relating to light and air; building contracts; dilapidations; professional questions between architect and client; and compensation cases. (Under this last head would be included insurance claims.)

With regard to the party-wall question under the London Building Act, 1894, this is really the most frequent of disputes arising in our practice. The method of dealing with it is very carefully set out in section 8, and I need hardly here waste time in describing the nature of the procedure. It amounts to this, that an arbitrator or surveyor is appointed by the building owner, and another by the adjoining owner, and if these two gentlemen cannot agree on the merits of the case, they must agree to refer the matter to the umpire, technically known as the third surveyor.

With regard to the dangerous structures, this is a new form of arbitration, arising under the Act of 1894. Formerly all such cases were under the jurisdiction of, and were tried at, the police court of the district. It is now open to any one considering himself aggrieved by the receipt of a dangerous structure notice to give notice under Part 9 of the Act, provided he does so within seven days, requiring the matter to be referred to arbitration and clause 107 of the Act prescribes the method in which this shall be done. It is practically a repetition of the procedure in party walls, with the exception that the award is signed by the arbitrator or umpire only. In this case, if the owner of the alleged dangerous structure does not demand within seven days after service of the notice the appointment of an arbitrator, the matter reverts to the police courts, as under the former Acts.

We now come to arbitrations on questions of light and air, by far the most difficult of any with which an architect or surveyor can be called on to deal. The state of the law on this subject could not be more unsatisfactory than it is, owing to the conflicting decisions of various judges and the reversal of the judgments of the court of first instance by the Courts of Appeal—notably in recent cases. Efforts are being made to obtain a revision of the law as to easements of this class by a joint Special Committee appointed by the Royal Institute of British Architects and the Surveyors' Institution, with the assistance of two eminent King's Counsel. A Bill will be introduced into Parliament, we hope, in the current session. The main principles of the proposed Bill are settlement by arbitration, the proceedings being similar to those under the Factory Act; the elimination of extravagant claims for special uses of ancient lights; the extinction of claims of this class in future buildings not already possessing ancient lights; and the simplification of means of objecting to such lights being acquired by the simple means of giving a statutory notice of objection instead of the present cumbrous and barbarous means of erecting and maintaining screens or other physical obstructions. Arbitrations under this head arise under different circumstances. The arbitrator or umpire may be appointed by agreement; he may be appointed by the Judge of the Court in which the case is tried, or he may be required simply to report to the Judge his independent opinion of the case. In this sense he is practically an arbitrator, inasmuch as the Judge would probably, and in nearly every case, give his judgment in accordance with such report, if confined strictly to questions of fact. The duties of the arbitrator here are very wide, and he can, and should, often do much to bring the parties together by suggesting a reasonable compromise, either by the modification of the defendant's proposed building by reasonable compensation for the injury likely to be inflicted, or often successfully by suggest-

ing an improvement to the plaintiff's building—of course, in the latter case to be carried out at the expense of the defendant.

The next class we have to deal with are dilapidations. These are more strictly matters of account. The repairing clauses in leases and agreements are often vague, and it is, therefore, often difficult to arrive at a decision. The arbitrator must determine on the items of claim which he intends to allow, and after that, price them according to the best of his knowledge.

A more delicate question than that arising between architects and their clients cannot be conceived. The procedure is the same as in other arbitrations, but in this—more than in any other class of cases—there is apt to be personal feeling and recrimination. In my own experience most such cases arise where the so-called architect is not a member of the Royal Institute of British Architects, but nevertheless attempts to use, and often to unduly interpret and strain to the utmost, the schedule of professional charges.

With compensation cases the architect has comparatively little to do. These claims generally arise with reference to properties taken under the authority of an Act of Parliament. I am sorry to say that, with the occasional exception of the plaintiff's case in actions for injury to light and air, there is no class of arbitration or trial in which such exaggeration takes place as in compensation cases. This would seem to arise under the idea that a jury or an arbitrator would average the claims made against the counter offers.

With regard to the duties of arbitrators and umpire. Should arbitrators be employed, their duty is to prepare each his own case; to boil it down and simplify it, so as to only produce the salient points of real importance at the hearing. He should, if he can, endeavour to ascertain and to work out the opponent's case, so as to be ready to meet his opponent's arguments. He should have every drawing, every paper that he has to produce during the case readily accessible and at hand, in order to avoid waste of time. In party wall cases, before the third surveyor is called in, accurate drawings should be made of the wall, both in plan, elevation and section. The wall should be plumbed to ascertain how far, if at all, it is out of the upright; and the nature of the materials of which it is composed should be as far as possible ascertained. The surveyor to the building owner should also be prepared to state exactly what he really proposes to do, which cannot always be disclosed by the statutory party-wall notice, as this has to be given in advance, and it is not always possible at first to ascertain the exact circumstances of the case and condition of the structure in question.

Now, in speaking of the duties of arbitrators as such, where there is an umpire, I may as well say that under this head I include the duties of architects or surveyors who have to prepare their side of the case for hearing. In all of these cases the same care should be taken in preparation—no points should be overlooked, and the points likely to be raised by the opposite side should be foreseen. The two architects, whether acting as arbitrators or not, should before the hearing agree to facts as far as they possibly can; they should verify each other's drawings. In cases of light and air they should prepare a model, to be jointly agreed upon by both parties, and they should do everything to avoid disputes as to fact at the hearing, so that time will not be wasted in producing a lot of evidence to prove anything which ought not to require proof at all.

With regard to the Factory Acts, arbitrations are a procedure of comparatively modern form. They arise out of the operation of the original Factory Act and of numerous amendments of such Act, and are confined to determining the necessary provision for means of escape in case of fire, and to certain sanitary arrangements, both of which appear formerly to have been much neglected. Many difficult cases arise, owing to practical considerations, and the necessity of obtaining rights of way or access to the premises of neighbouring owners. In this case the presence of umpire and two arbitrators is necessary at the hearing. The parties may or may not be represented by solicitors or counsel. The decision, however, rests solely with the umpire. As in all other cases, there is an appeal

to the Courts; but this appeal can only be on points of law and the validity of award, but not upon the facts as originally decided.

Troublesome matters are arbitrations arising out of builders' contracts. Here, again, much can be done to shorten a reference by agreeing beforehand to such items as possible, and also by agreeing in what order the claim and counter-claim, if any, should be taken, so that in case of need an interim decision may be given, shortening disputes only too likely to prolonged. Under the form of contract now in general use, the arbitration can only be opened after completion of the works, or when either party is dissatisfied with the architect's final certificate. But there are many cases in which much friction can be avoided and time saved by a hearing during progress of the works. The architect of a building must always remember that he is not only the agent of his client or employer. He must also during progress of the works as above mentioned hold the scales of justice between employer and contractor. Questions as to material and workmanship may arise which it is difficult to determine later on, when much of the constructive work has been covered up.

As to dilapidation arbitrations, I think I have already said nearly as much as I need. These rarely get into the Courts; they are generally settled by the surveyors on behalf of claimant and landlord, and tenant or defendant, an agreement being come to before negotiation, as to the name of the third person, or umpire, whose decision shall be final. They are matters of little interest, rarely involving any special principle of law, but really only being a money dispute.

With regard to disputes between architects and clients, I think I need add no more to what I have already said. In compensation cases, the procedure is practically the same as in other arbitrations already noticed.

I have, therefore, so far, I think, defined the various methods of procedure, the duties of the umpire and arbitrators, including under the latter head the architects or surveyors employed to advise their respective clients.

We now come to the preparation of awards. The first duty of the arbitrator or umpire is to ascertain that he is properly and legally appointed, to receive and take into his possession the documents or agreements referring to such appointment, to ascertain generally the nature of the claim and counter-claim, if any, so as to avoid what I may call fishing claims, and to regulate the order in which the case shall be heard. The arbitrator or umpire may be appointed in various ways; he may be appointed by a judge of one of the High Courts; he may be appointed by agreement, or by some person to whom his nomination has been referred, such as the President of the Royal Institute of British Architects, or of the Surveyors' Institution; he may be the person specially nominated in a building contract as the arbitrator. The preliminary points being settled, he must proceed with the hearing, first arranging as to whether witnesses are to be sworn, and must show great patience in allowing all matters to be brought forward, and at the same time firmness in stopping irrelevant matter and personal recrimination. He sometimes may, in questions of light and air particularly, be able to make a suggestion which practically puts an end to the case, and it is his duty, whenever he can do so, to shorten the proceedings by means of proposing a fair compromise. He should avoid interfering in the conduct of the case, leaving each party to conduct his own case, and only speaking when it is necessary to give a decision on a point of procedure or to settle or define a doubtful answer. He should particularly avoid showing any leaning to either side, and should allow no expression of his opinion as to the merits of the case to escape him. In rare cases it may be necessary for him to give an interim decision, or to state a case for the opinion of a superior court prior to proceeding further; for instance, he may have to decide in a disputed account whether or no there is a contract; but this should not be done unless absolutely necessary. At the conclusion of the hearing, having given both sides a fair and impartial opportunity of bringing forward evidence and statements, he should reserve his decision in order to read through the evidence and his own notes. These he should make himself, shortly,

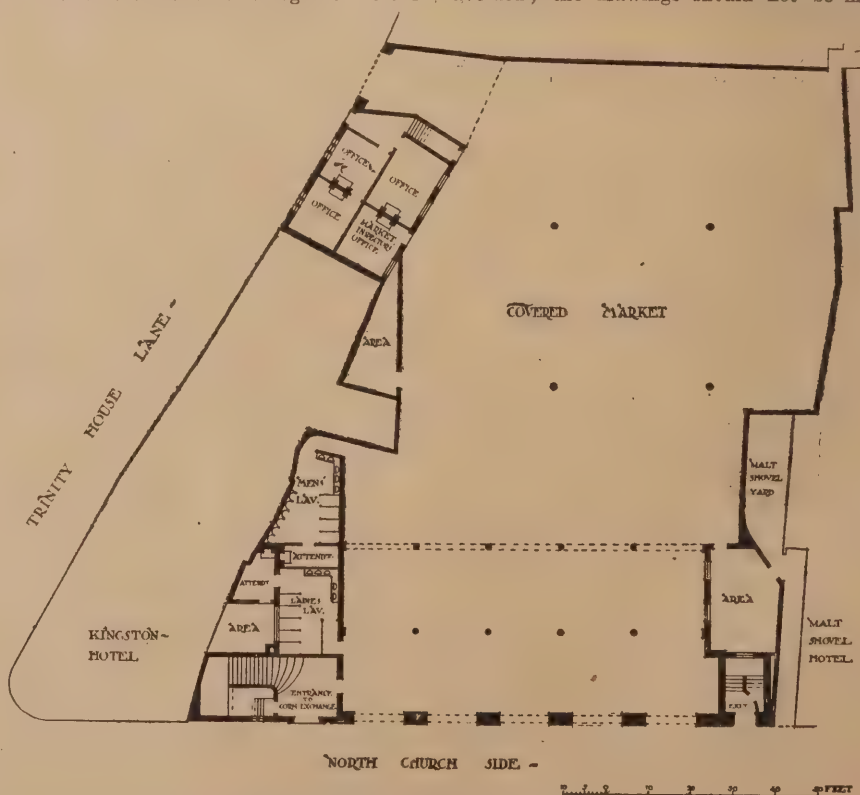
both of the arguments on either side as well as of the heads of the evidence. If shorthand notes are taken throughout the whole of the proceedings, his own short notes, embodying only the salient points, are much easier of reference than a verbatim report. It is always well to agree, with regard to shorthand notes, by whom they shall be paid for in the first instance, and that they shall be accepted as correct by both parties. It is perfectly useless to have two shorthand writers, one on either side. Generally speaking, it is convenient to have shorthand notes taken of the whole case, without necessarily having them transcribed in their entirety. It saves a great deal of time to have the speeches of counsel and arguments transcribed, as it is impossible for the arbitrator or umpire to follow these exactly with his notes without causing great delay. The heads of evidence he must himself be able to take down. In purely technical cases, such as dangerous structures, party- or party-fence walls, arbitrators or umpires should be capable of drawing their own awards. In fact, the Act would seem to preclude the employment of solicitors or counsel in these cases. The award should always begin with a recapitulation of the origin of the dispute; under what circumstances it has arisen, whether under contract or otherwise. This part, generally called the preamble, should be accurate and should enumerate the whole matter concisely. The award itself should be drawn carefully in as few words as possible, setting forth the items in dispute in separate paragraphs, one paragraph to each item rather than a connected sentence, stringing them all together, and it is sometimes necessary to attach and refer to diagrams or plans, &c. In it the arbitrator must recollect that he is both judge and jury, and in fact he has more power than a jury. A jury's decision can be upset on the ground of misdirection by the judge who sums up. An arbitrator has no one to sum up to him, and his decision on the facts is absolutely final, except as I have mentioned in party-wall cases. In most cases, except those above-named, it is advisable to employ a solicitor to draw the award, furnishing him, of course, with all documents necessary to draw the preamble, but not with more than the heads of the decision at which you have arrived. If a legal point is strongly contested during the hearing it is better to state at once that if such point is insisted upon you will make your award subject to a special case to be stated to one of the superior Courts. An arbitrator must also remember that he is not altogether in the

position of a judge. He has to decide on facts, and not on law, and for that reason it is undesirable and unusual that he should in any way give any hint of the reasons which have induced him to come to his decision. I have heard it said that this is cowardly, and that a man should be prepared to give his reasons for anything that he does, but I cannot see that this accusation is correct. The arbitrator has to do his duty according to his conscience, and the very essence of his employment is to put a final end to the dispute. His simple decision on a point of fact is an end of this, whereas if he gave reasons he might leave the matter open to continued and prolonged further litigation. Where a case is stated for the opinion of the superior Court it is necessary to give alternative decisions—that is, if the Court rule one way, then the decision will be so-and-so, the alternative decision being given in case the Court rules the other way.

As to costs of arbitrations, these generally follow the decision, but in many cases both parties may be equally in the wrong, and it may be necessary to give some decision as to how costs are to be allotted. Both parties cannot be equally in the right.

One last word on awards. In making an award do not hesitate, or attempt a compromise. As far as possible give your award one way or the other. Nothing is so unsatisfactory to both parties as striking a balance, or "splitting the difference." Care must also be taken to issue the award within the periods prescribed by the Arbitration Act. But the umpire or arbitrator has power to enlarge the time for this, provided he does so in writing prior to the expiry of the prescribed period.

Now, having spoken of arbitrations, I should like, with your permission, to speak on the question of their avoidance. In building contracts, for instance, the necessity for arbitration often arises out of carelessness, either in the preparation of drawings, specifications and sometimes of quantities, or out of the want of proper notes made during the carrying out of the works. It is only fair to a builder or contractor that at the outset of the job he should know fairly well what he has to do. To him it will make a great difference in organising his work and in ordering his materials; in fact, it may make the difference to him between profit and loss. In the first place, in contract drawings every line should be definite, and should mean something; every colour should be an indication of material; shading should be avoided; the drawings should not be mixed,

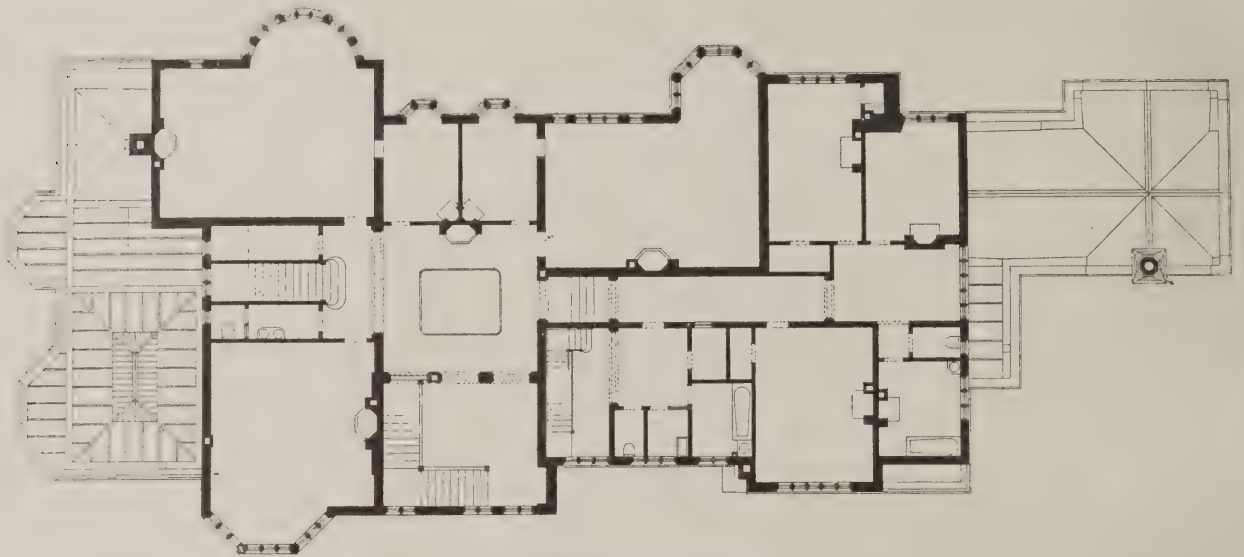


GROUND PLAN OF FRUIT MARKET AND CORN EXCHANGE, HULL.
JOSEPH H. HIRST, CITY ARCHITECT.

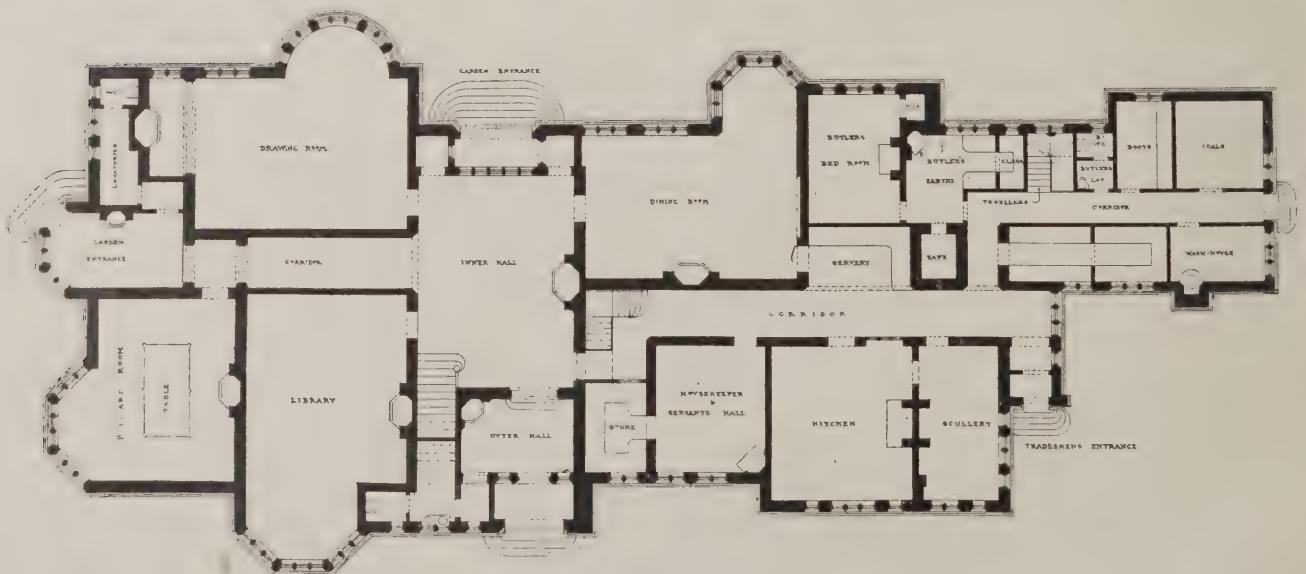
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, April 30th, 1902.



SOUTH-WEST ELEVATION.



FIRST-FLOOR PLAN.

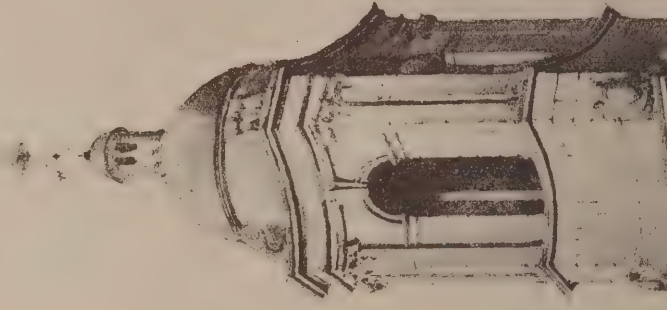


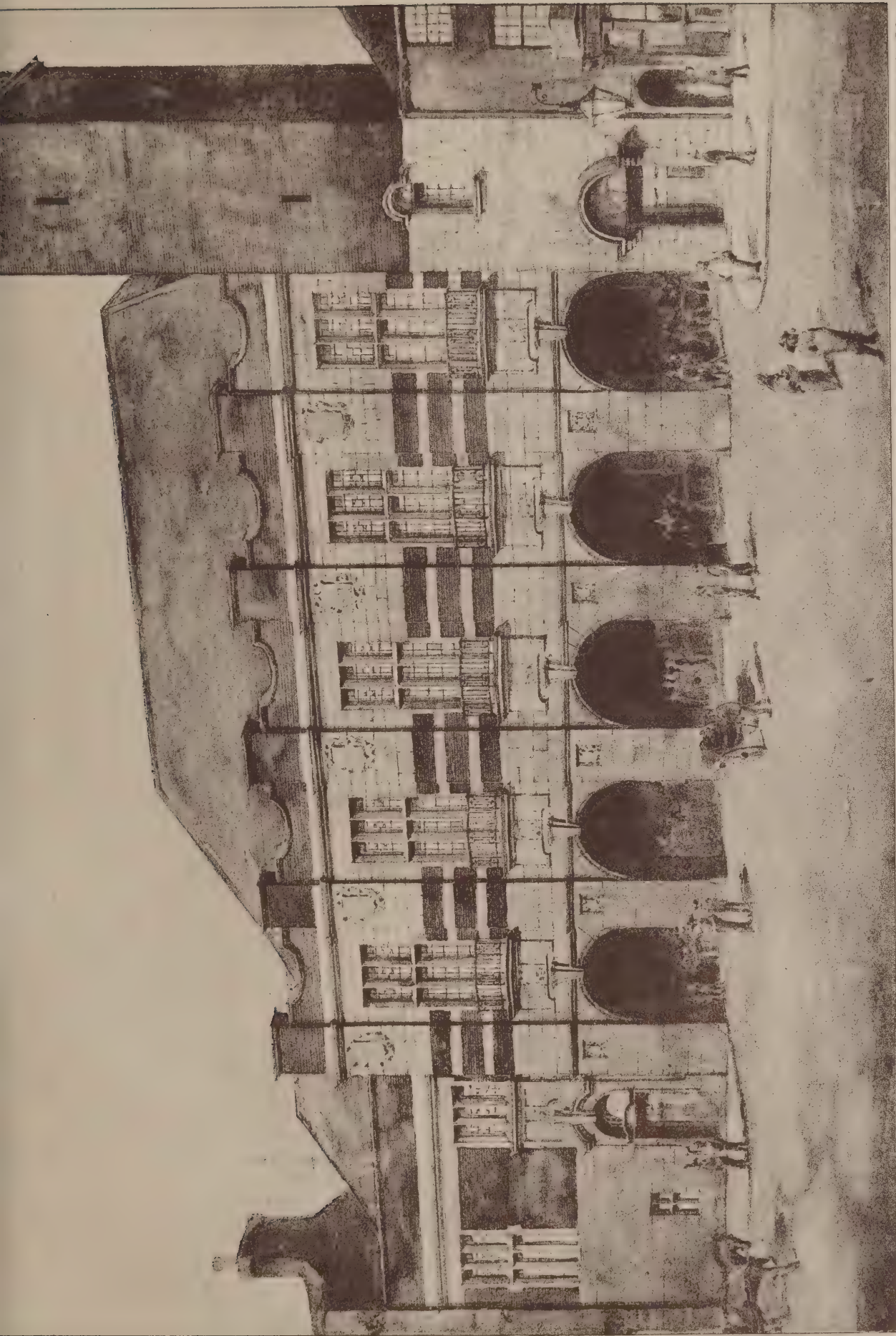
GROUND PLAN.

DESIGN FOR A COUNTRY HOUSE. SIDNEY V. NORTH, A.R.I.B.A., Architect.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, April 30th, 1902.

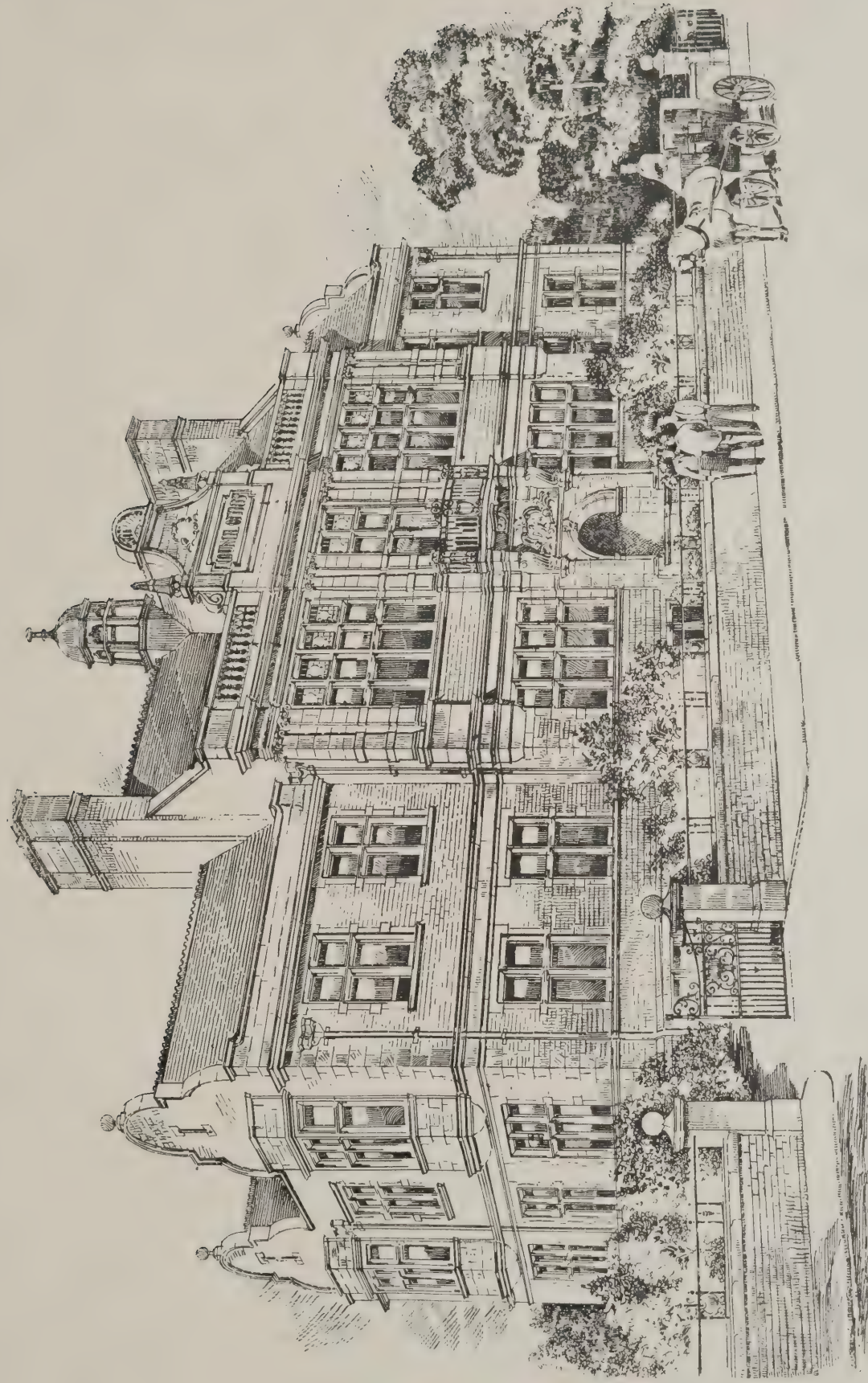




"INK-PHOTO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

FRUIT MARKET AND CORN EXCHANGE, HULL. JOSEPH H. HIRST, City Architect.

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NEW COUNCIL OFFICES, HEATON MOOR, STOCKPORT. WOODHOUSE & WILLOUGHBY, Architects.

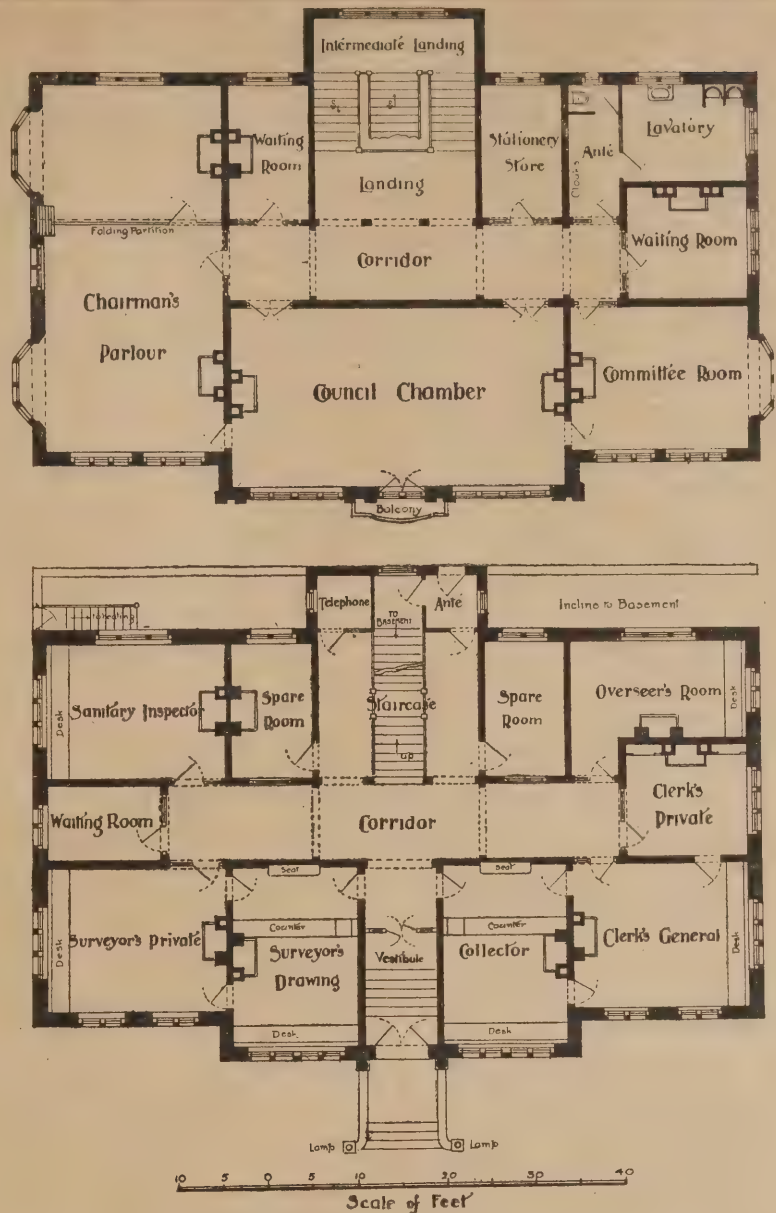
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Details being superimposed upon small scale drawings. Everything should be set out as far as possible with the view of giving the workmen actually employed what amounts to a book that they can read. Drawings and draft specifications should be completed before being placed in the hands of the quantity surveyor. Generally the quantities form no part of the contract, but it is only fair that the notes made by the quantity surveyor during the progress of his work should be carefully considered and added to the drawings and to the specification. The quantity surveyor should also have ready access to the architect during the process of taking out quantities, in order that any point not clear on drawings, &c., can be made so before the work is tendered for. An architect should, as far as possible, avoid all alteration of his design during the progress of the works, and ought to have made up his mind beforehand what he wants to have. Alterations are a fruitful source of dispute, though they often cannot be avoided on account of the idiosyncrasies of clients. The next great cause of dispute arises out of the question of giving orders for extras, omissions and variations. It is almost impossible on works to give a written order for every variation and instruction required, but the clerk of the works or foreman can be instructed to make notes of these as they occur from day to day to submit them to the architect on his next visit, and if the architect initials them they can be then acknowledged to be orders in writing under the terms of the contract. The proper provision of full-sized and detail drawings and other details at the earliest stage of the works is of great use to the contractor, and the showing of consideration to him in facilitating the setting-out of the work and the ordering of goods is an inducement to him to do his work conscientiously. Of course, builders are also often in fault, raising contentious and unwarrantable claims. The only remedy for this is steadily to refuse to entrust them with further work. With one more remark I shall conclude. A constant source of trouble in contracts is the attempt to please our client by trying to get a larger amount of work or more elaborate work done for him than an architect can properly expect for the amount placed at his disposal.

Mr. A. O. Collard, in proposing a vote of thanks to Mr. Gruning, said he thought there should be no law with regard to ancient lights, for everyone should be required to build with a regard to his neighbour's land. Mr. Henry T. Hare seconded the vote. He thought that quantities should always be made part of the contract. Mr. H. J. Leaning said he was looking forward to the time when a special court of law would be established to deal with building matters. The objection to arbitration was that no precedents were established. Messrs. C. H. Brodie, H. A. Satchell, Henry Lovegrove and G. B. Carvill also spoke. Mr. E. A. Gruning in reply said he agreed that there should be no law of ancient lights, but as it was useless to try and get it abolished the Institute was doing its best to get the injustice minimised as much as possible, and there was no doubt the Bill it was promoting would go very far to do away with disputes.

R.I.B.A. ANNUAL REPORT.

THE annual report of the Council for 1901-2, to be submitted at the annual general meeting next Monday, states the present membership to be 1,732, made up of 617 Fellows, 1,071 Associates and 44 Hon. Associates: a nett increase of 37 during the year. Reference is made to the following appointments—Mr. W. M. Fawcett and Mr. W. H. Seth Smith as representatives of the Council on the Council of the Architectural Museum; Mr. P. Gordon Smith on the Board of Directors of the Architectural Union Company, in place of the late Mr. Arthur Cates; Mr. E. A. Gruning on the Tribunal of Appeal, also in place of the late Mr. Cates; Mr. W. D. Caröe as representative on the Coal Smoke Abatement Society; Mr. Thomas Blashill and Mr. John Slater as representatives of the Institute at the annual congress of the Sanitary Institute to be held next September at Manchester. The portrait of Mr. Penrose (by Mr. Sargent, R.A.) has been copied



GROUND AND FIRST-FLOOR PLANS, NEW COUNCIL OFFICES, HEATON MOOR, STOCKPORT. WOODHOUSE & WILLOUGHBY, ARCHITECTS.

for Magdalene College, Cambridge, by Mr. C. M. Newton. The Council supported the Ulster Society of Architects with regard to certain clauses in the Belfast Corporation Bill (see p. 343 of our issue for January 1st last); these clauses have now been dropped in Committee of the Lords, and the Society have withdrawn their opposition. The joint committee have drafted a "Bill to amend the Law relating to Easements of Light" which has received the approval of the Institute and the Surveyors' Institution, and the matter has been referred back to the joint committee, with powers to bring the Bill before Parliament as soon as possible. The Council have invested £1,000 in Indian Government Stock as the nucleus of a Building Fund for new premises (which are urgently needed), and will be glad to receive any donations. A joint committee of the Institute and of the Architectural Association have met to consider the combination of the two organisations in one building scheme; the Council, while agreeing that they should both occupy one site, think that the respective premises should be to all intents separate buildings. Sites are now being considered. The Institute needs about 10,000 ft. super, and the Association half that space. The Council have granted fifty guineas to the Cretan Exploration Fund (Knossos excavation) and twenty guineas a year for five years to the British School at Rome. There is a balance of £1,300 over expenditure for the year; and additional investments have been made which bring the total invested capital up to £11,500.

The Art Standing Committee report that,

although the whole of their suggestions with regard to the widening of London Bridge were not adopted, modifications have been made on the lines they recommended. A letter was sent to the Dean of St. Paul's asking that the designs for the proposed decoration of the drum of the dome might be publicly exhibited before the work was begun, but the Dean's reply contained no undertaking that there should be such an exhibition. The Science Standing Committee report that the results of the experiments for ascertaining the strength of different kinds of brickwork will, it is hoped, be shortly issued in pamphlet form. The supporting power of rocks and soils is still under consideration, as well as the proposed standard sizes of steel sections, and the subject of cement-concrete in flats and floors.

The Manchester Society of Architects held its annual general meeting on April 24th, when the following officers and members of council were elected:—President, Mr. Alfred Darbyshire, F.R.I.B.A., F.S.A.; vice-presidents, Mr. J. P. Cass, F.R.I.B.A. and Mr. J. W. Beaumont, F.R.I.B.A.; hon. secretary and treasurer, Mr. Paul Ogden, F.R.I.B.A.; assistant hon. secretary, Mr. George Brown; members of council, fellows: Messrs. B. W. H. Brameld, John Ely, F.R.I.B.A., E. Hewitt, F.R.I.B.A., J. S. Hodgson, J. Horstall, F.R.I.B.A., J. D. Mould, F.R.I.B.A., W. A. Royle, F.R.I.B.A., J. H. Woodhouse, F.R.I.B.A., and P. S. Worthington, M.A., A.R.I.B.A.; associates: Messrs. F. B. Dunkerley, A.R.I.B.A., A. H. Mills, A.R.I.B.A. and Isaac Taylor

Law Cases.

Serving Notices on District Surveyors.—At the South-Western Police Court recently Benjamin Briston, a builder, of West Norwood, was summoned by Mr. Percy Hunter, the district surveyor, for beginning to execute certain work without giving the requisite notice. Mr. Ward defended. It was pointed out that the notice was deposited by his client in the letter-box of a house at Norwood where Mr. Hunter had his office, and he (Mr. Ward) argued that this was a sufficient notification within the meaning of the Act. Mr. Hunter said as a matter of fact the notice never reached him. The magistrate thought it was not a proper service to place a notice through a hole in the street-door. Mr. Ward said such a contention might arise in the case of a large building set out in a number of offices, but Mr. Hunter rented the whole of the house. Moreover Mr. Hunter had an opportunity of receiving personal notice, for he understood that the notice was placed on his office table by the office-keeper, who gave evidence to this effect. The magistrate was satisfied that the notice never reached Mr. Hunter, but in the circumstances he only required the defendant to pay the costs of the summons.

Keystones.

The Queen Victoria Memorial Fund now stands at £194,000.

A New Library at Armley, Leeds, has been erected at the corner of Stocks Hill and Wesley Place. Mr. Percy Robinson, of Leeds, was the architect.

An Expansible Dining-Room.—Sir James Blyth has had set up in his home in Portland Place, W., means for noiselessly doubling the size of the dining-room. The partitioning wall, with doors, pictures, &c., is made to slide through the floor.

As a Coronation Memorial at Llangollen it is proposed to construct a massive stone bridge to span the River Dee near Berwyn station. The structure will in all probability exceed the estimated cost of £2,500, as the necessary foundations and abutments will have to be specially dealt with.

The New Fylde Joint Isolation Hospital at Moss Side, Lytham, has been opened. The hospital comprises a large pavilion for the treatment of scarlet fever and a pavilion for typhoid fever and diphtheria, nurses' home and administrative buildings, discharge- and waiting rooms, mortuary and ambulance, laundry and disinfectant, electric-light station and a porter's lodge. The architects were Messrs. Haywood & Harrison, of Accrington and Lytham; and Mr. Samuel Wilson, of St. Annes-on-the-Sea, was the contractor for the work.

A New Fire-Station at Stockport has been opened in Mersey Square. It is the centre of the electric tramway system, and the car sheds are in the rear of the new building. Central tramway offices are to be erected, with frontage in line and in harmony with the fire-station. A conspicuous feature of the new structure is a drying tower, rising to a height of 100ft. The style of the main building is Gothic, faced with Accrington stock bricks, with Scotch redstone dressings; the main entrance doorways are of stone. The building is divided into four blocks, namely, engine-house, stables, firemen's dwellings and workshops. The cost has been about £12,000.

A Statue of Beethoven has been executed by Max Klinger, the great German sculptor, who has been occupied with the work for no less than fifteen years. The statue is executed in bronze, marble, ivory and onyx. Beethoven is sitting on a magnificent throne as in a trance, meditating on the problem of symphony. The throne is cast in bronze and its back shows the marble heads of lovely geni. The body of the composer, leaning slightly forward, is in white Greek marble. His hands are clasped on his crossed legs, which are covered with onyx drapery. At the composer's feet is a mighty eagle with outspread wings looking up at him. It is a magnificent work, but will certainly not remain uncriticised.

The New Quarter-Sessions House and Coroner's Court for West Ham, erected and fitted by the Corporation at a cost of £13,000, was opened recently.

The late Mr. Phil Morris, A.R.A., who died last week in his sixty-eighth year, was apprenticed to an engineer in his early days, though he had no liking for the work. Ultimately, with the help of Mr. Holman Hunt, he was enabled to devote himself exclusively to the study of art.

Special Elections to Fellowship R.I.B.A.—Mr. Arthur Harrison (president, Birmingham Architectural Association) and Mr. Arthur Wakerley (president, Leicester and Leicestershire Society of Architects), as presidents of allied societies, have been elected to the Fellowship of the Royal Institute of British Architects.

A New Railway Station for Cross Gates, Leeds, is being erected by the North-Eastern Railway Co. The new station buildings will comprise the station-master's house, booking and station offices, waiting-rooms and lavatory, porters' rooms, platelayers' cottages and a large storage warehouse.

An Exhibition of Drawings from "Punch" will be opened at the Woodbury Gallery, 37, New Bond Street, W., on Monday, May 5th, the whole of the proceeds derived from admissions, by the kind consent of the proprietors of the gallery, being devoted to the funds of the Hospital for Sick Children, Great Ormond Street, Bloomsbury, W.C.

The Academy.—Last Thursday, Friday, Saturday and Monday were varnishing days at the Academy. Yesterday the gallery was given over to be cleaned and swept. To-day and the forenoon of to-morrow are for the critics; Thursday afternoon for royal and distinguished visitors. Friday is the private view, Saturday the banquet, and next Monday the galleries are open to the public.

Partnership Dissolved.—The partnership subsisting between Messrs. William Rycroft & George Atkinson Firth, architects and surveyors, of Bank Buildings, Manchester Road, Bradford, under the firm of Rycroft & Firth, has been dissolved by mutual consent, and in future the business will be carried on by Mr. William Rycroft alone, in his own name, who will pay and receive all debts owing from and to the said partnership.

A Statue of Queen Anne at Kingston-on-Thames was unveiled by Viscount Hayashi, the Japanese Minister, last week in the Market Place. The statue has, according to report, beep in the town since the renovation by Queen Anne herself of the old Market Hall, originally built by Queen Elizabeth and removed in 1840 to make room for the present one. All that now remains of the ancient hall is the market bell, some stained-glass windows, and the statue, but the last had grown dingy with the passage of years, and it has now been re-gilt.

Mr. Seymour Lucas, R.A., in opening a picture exhibition at West Ham last week, said the Church in the Middle Ages thoroughly realised the advantages of pictures. In the days of the Renaissance many of the churches were turned into little picture galleries and had their influence. Photography had had a bad effect on art; it served to present things in a literal sense rather than a poetic sense. Realism in art was not wanted; the great painter put into his work his art, and it was that which was the merit and value of the work. Plate-glass, which flooded places with light—whereas art was all light and shade—had also robbed art.

Building Scheme at Chiswick.—An influential body of capitalists have purchased 330 acres of land stretching from Burlington Lane to the river-frontage in Grove Park. The amount of the purchase is not known, but must be considerable. The Duke of Devonshire, from whom the land has been bought, has insisted upon reserving to himself the right of purchasing all the land which may be required for building churches in the town, which is to be called Burlingwick. The promoters have had an interview with some members of the Chiswick District Council on the spot to discuss the sale to them of 12 acres on which to build workingmen's dwellings, and also matters relative to the council taking over the river-frontage of two miles for a promenade.

Queen Victoria Statue for Newbury.—Mr. George Sanger is giving a statue of Queen Victoria to the town, of which he is a native. The statue will be 25ft. high and will have a sculptured lion at each corner of its base.

Savoy Theatre, Strand.—The St. Pancras Iron-work Co., Ltd., have just completed the erection of the new iron and glass-covered way at this theatre, in connection with the alteration of the levels between the Savoy Hotel and the Strand.

A New London Theatre.—The London County Council have given their approval to the site of a new theatre, to be named "The King's," at Haverstock Hill. The plans for the building are under consideration.

New Church Schools at Winlaton have been erected at the junction of West Lane and Scotland Head. Mrs. M. A. Armstrong, of Blaydon, was the contractor, and Mr. J. H. Morton, F.R.I.B.A., of South Shields, the architect. The cost has been £2,800.

To Prevent Fires in Russia.—A fire insurance congress is at present being held in Russia, and one of the recommendations made is that loans should be granted by the Czar's government to peasants in order that they may build houses of stone instead of wood, and so reduce the risks of fire.

On the Site of the Old Salford Barracks 320 workmen's dwellings and thirty-two large shops are being erected at a cost of £112,000. The authorities have provided in the scheme for the erection of a church, a girls' club, a lads' club and a public hall, and also for the laying-out of a recreation ground in the centre.

Another Carnegie Library.—Mr. Andrew Carnegie has informed the Mayor of Stratford-on-Avon that he will defray the total cost of a library and reading-room for the town if the Corporation will provide a suitable site. Mr. Carnegie is to be invited to select one or two eligible sites in the centre of the town belonging to the Corporation.

New Municipal Buildings at Colwyn Bay are proposed to be erected, the District Council having secured a site in Conway Road one acre in extent. It is suggested that an open competition be held, premiums of £60, £40 and £20 respectively being offered for the best three designs; and it has been decided to apply for the sanction of the Local Government Board to carry out the scheme.

Verrio's Picture at Christ's Hospital.—The immense picture, 90ft. long, by Antonio Verrio, belonging to Christ's Hospital has been successfully raised into position in its new home under the direction of Mr. C. W. Carey, keeper of the picture gallery at the Royal Holloway College, Egham. Mr. Carey has re-lined, cleaned and restored the picture, which now shows the original brilliancy of its colouring.

A New Wesleyan Church at Wiltshire is being erected at a cost of about £3,000. It will accommodate 224 persons, exclusive of the choir. The edifice will consist of nave, transepts and chancel. The minister's vestry and organ recess are to be placed on the ground floor, and owing to the sloping nature of the site, the architects Messrs. W. J. Morley, F.R.I.B.A., & Son, of Bradford, have been enabled to provide below the transepts and chancel a large assembly-room. The woodwork of the open roof and that of the pews will be pitch-pine.

Mr. William Hole, E.S.A., delivered a lecture on "Painting in relation to Architecture" in the large gallery of the Albert Memorial, Dundee, last week. He said that since he adopted art as a profession thirty years ago very great changes had been made in mural painting and its sphere was infinitely expanding. The word art was no longer synonymous in the public mind with that of mere picture-making, but was understood also in its wider and its truer sense as the power of beautifying. Sculpture had been brought in for the enrichment of the elder art of building, and he contended that pictorial art, no less than what was known as decorative art, should also be enlisted to a similar purpose in the service of architecture. No art could be popular which was not decorative, and if their painters, their sculptors and their architects desired to make art popular they would have to teach the way. He counselled all art students, no matter what their ultimate ambitions might be, to study simultaneously during their period of pupilage architecture, painting and sculpture, and to specialise afterwards.

Bricks and Mortar.

APHORISM FOR THE WEEK.

*O great Rialto, the vast round
Of thy thrice-solid arch profound!*
CLOUGH ("Dipsychus").

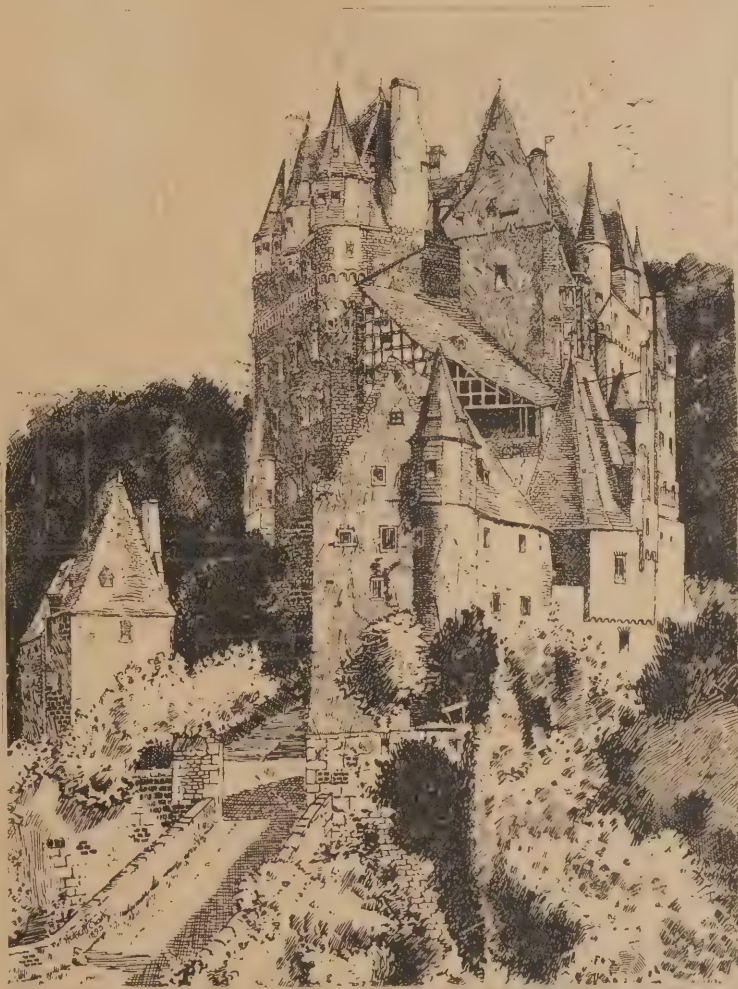
Our Plates.

THE new offices of the Heaton Norris District Council are situated at the corner of Thornfield Road and Green Lane. The structure is of stone, with Yorkshire parpoint facings and Alderley stone dressings, the roof being covered with Tilberthwaite green slates. The main facade fronts Thornfield Road. Entered from the main corridor on the ground floor are the administrative offices, and on the first floor is the council-chamber, which occupies the entire central part of the front of the building. It is 40ft. long by 21ft. wide and 13ft. high. The ceiling is coved to lend resonance to the voice. There is also a retiring- and a committee-room. The architects are Messrs. Woodhouse & Willoughby, F.F.R.I.B.A., of Manchester, who won the first premium in the limited competition held about five years ago amongst nine competitors. The general contractors were Messrs. A. R. Bullwant & Sons, of Manchester and Moston. Mr. Samuel Mellor was the clerk of works. The following were the sub-contractors:—Heating and ventilation, Mr. E. Hatton; mosaic flooring, Messrs. Patteson; art metalwork, Mr. A. Standing; sanitary fittings, Messrs. Shanks; ironmongery, locks, &c., Messrs. Marley Brothers; wood-block floors, Mr. E. P. Garth; grates and mantels, Messrs. C. W. Williams & Co.; stained-glass windows, Mr. S. H. Leyland, of Weaste; gas fittings, Messrs. Baxendale; furniture, carpets, &c., Messrs. Kendal, Milne & Co.; patent folding partitions, Messrs. Peace & Norquoy; fireproof door to strong-room, Messrs. John Port & Co., of Ancoats; and lathing, Mr. J. J. Millson. Where not otherwise stated, all these are Manchester firms.—The covered Fruit Market and Corn Exchange, Hull, will occupy one of the best positions in the city. The building practically forms one side of a large open square already devoted to market purposes. It is in close proximity to the church of Holy Trinity, the largest parish church in this country, and also the old Grammar School, an interesting brick building erected in 1585. The proposed buildings cover an area of over 2,000 sq. yds. with frontages to two busy thoroughfares. The principal entrance to the fruit market (shown in our illustration) is in North Church Side. Other entrances are in the the Arcade and also in Trinity House Lane. An ornamental steel roof of three spans covers the market, and patent glazing will be extensively used to give light to the stalls beneath. There are the necessary office and storerooms for the market-keeper, together with ample lavatory accommodation for both males and females. Capital suites of offices are arranged in a four-storey building at the Trinity House Lane front. The Corn Exchange occupies part of the first floor over the main entrance to the market and is approached by stone staircases, one at either end of the building. In connection with the Exchange there is a crush-room, stage, two retiring-rooms with the usual w.c.'s and lavatories. The interior of the main hall will have a high panelled dado and a curved ceiling with fibrous-plaster ribs and panels ornamented with the arms of the city. Externally the walls, with the exception of an unpolished granite plinth, will be in Ancaster stone and thin red bricks. The cost of the buildings is estimated at £10,000. The drawing from which our ink photo is taken is hung in this year's Academy, and was submitted by Mr. Joseph H. Hirst, city architect, of Hull.—In Mr. Sidney V. North's design for country house the intention is for the walls to be of irregular coursed ashlar in Portland or Bath stone, the dressings, &c., to be of the same material. The windows are to be glazed with leaded lights of heavy lead comes with 6in. squares in wrought-iron casements. The material for the roofing is to be green Westmorland slates, with the hips and ridges of lead.

Schloss Elz. SCHLOSS ELZ, an ancient residence of the Counts of Elz, most picturesquely situated at the top of a rocky hill rising in the middle of the beautiful valley of Elz, which is one of those extraordinarily narrow valleys so frequently to be met with in the Mosel district, has outlived most of its compeers and is one of the best preserved specimens of a mediæval château. This quaint pile, with its oriel and dormer windows, turrets, gables of timber, plaster and slate, all huddled together without apparent design but in perfect harmony, has escaped the ruin which the effects of violence has wrought upon the greater number of the feudal castles, and has suffered little injury in character from restoration work. It is unique both externally and internally. The only approach to the castle is by means of a bridge built across from the rock of the adjacent hill-side, on the opposite height of which are the ruins of Trutz-Elz, erected by Baldwin, Arch-

Decorations for Westminster Bridge.

THE students of the Royal College of Art Modelling School have prepared an elaborate scheme for the decoration of Westminster Bridge. It is proposed to cover the bridge with linked arches of foliage and drapery, each forming a canopy to a modelled figure of one of the principal monarchs of this country. The crown of the bridge is the place of honour, and this would be given to the two great queens, Elizabeth and Victoria. At either end and on each side is to be, if the scheme is accepted, a great recumbent lion about 12ft. in length, and between the arches masts, with flags and esutcheons. Models and sketches have been prepared and the whole of the details considered; so that if the necessary funds can be obtained the work can be at once proceeded with. The estimated cost is £750, exclusive of any provision for special lighting at night, flares for which could probably, however, be provided



SCHLOSS ELZ, MOSEL. DRAWN BY H. FULLER CLARK.

bishop of Treves, to command the castle, with the counts of which he carried on a protracted feud. Many of the apartments are furnished in the ponderous style of bygone ages, and the walls are hung with scores of old family portraits, ancient armour, tapestries, weapons and other antiquities possessing considerable interest and charm. Those of the more martial character have been well used in their day by the noble occupants of the schloss, who not content with quarrelling with their neighbours were so given to blows within their own family circle that at last a most extraordinary agreement was drawn up and signed by all adult males in the castle, that if any of the inmates should kill, disable or wound another, the offender should be banished from the castle and deprived of its privileges to the extent of the injury inflicted. Apparently, according to their code of honour, it was quite a matter of indifference as to what harm might be done to others outside their own circle. His Majesty King Edward VII. during his tour in Germany when Prince of Wales visited this striking spot.

at a moderate increase. This cost is for unskilled workmanship and materials only. The whole of the modelling would be done gratuitously by the students and their master, Professor Lanteri. The London County Council has been approached on the subject.

An Architect's Claim.

A SCHEME for the erection of the Church of St. George, Stoney Hill, South Shore, Blackpool, was originated in 1900, when £10,000 was contemplated as the cost. Mr. Goldsmith, of Manchester, was appointed architect. The scheme was, however, found to be too expensive, and it was decided to erect half the church to commence with, and Mr. Goldsmith was asked to send in plans. The second scheme was also found to be too costly, and though Mr. Goldsmith again cut down the amount the committee eventually came to the conclusion on April 1st that they could not proceed with the building of the church at all. Mr. Goldsmith sent in a claim for £315 for professional services, and it was resolved to offer to him £50 in full settlement

without prejudice. A sub-committee was also appointed to meet Mr. Goldsmith with a view to making some equitable arrangement, but the architect refused on two occasions to meet them, and has now issued writs for the recovery of the full amount against the Rev. S. Y. B. Bradshaw, the vicar of Holy Trinity Church, South Shore, the Rev. W. Woodall, the curate, Dr. Broadfoot, the advising solicitor, and Mr. D. O. Ramsbottom.

An Image of Buddha. A NEW palace, with its necessary adjunct, a wat or temple, is being built for the King of Siam at Dasit Park, just without the city of Bangkok. The ceremony of the 13th of December last consisted in placing a new statue of Buddha within the wat. Some time ago his Majesty went north to Pitsanuloke to be present at the casing of this image, and there he remained for six weeks with his retinue of 3,000 soldiers and courtiers. The Phra Buddha was then brought down to the Royal Naval Arsenal at Bangkok, whence it was conveyed to the new temple Wat Benchamabophit. The figure, which weighs $6\frac{1}{2}$ tons and which was cast in three pieces, is of bronze taken from six ancient Siamese cannon, the whole having been gilded by a number of devout Buddhists, the King himself gilding the face. It represents Buddha in the usual sitting posture, legs crossed and hands with the palms upwards. The height is 9ft. without the pedestal, and the breadth from knee to knee 6ft. Though merely gilded at present, it is intended to be covered with plates of gold.

The New Necropolis Offices. IN order to enlarge Waterloo Station the London and South-Western Railway Company had to acquire the old premises of the London Necropolis Company, which had a small station to the left of the terminus for the purpose of conveying bodies to Woking for cremation. In return for the demolition of these premises the railway company have built new offices and a new station for the Necropolis Company. Entrance to the new building is gained by an archway in the Westminster Bridge Road. On the ground floor are the various workshops, where are manufactured the accessories of a funeral. On the first floor, to which access is gained by a staircase of noble proportions, are the offices of the many departments of the business, such as the cemetery, monumental masonry, stables and funeral furnishing. All the woodwork is in English oak, unpolished and unvarnished. The Necropolis Station, which is approached by passenger lifts, is roofed with glass and has walls of white tiles. Complete privacy is ensured by high walls, and it is not until the train has passed the limits of the station on its forty minutes' journey to Woking that it comes into the view of the public. On the platform are many waiting-rooms. Each funeral party will have a waiting-room to itself. A feature of the new station is the chapel, where a coffin may lie in state, or where the first part of the funeral service may be held in the event of there being mourners who find it impossible to journey to Woking for the actual funeral.

Cheap Dwellings at Harrogate. MR. SAMSON FOX, of Harrogate, with the object of demonstrating that model dwellings can be built in Harrogate, to let for something like half the present rents paid by the working class, has secured two acres of land on the Stonefall Estate at Starbeck, within the borough. Plans have been completed for eight blocks of four houses each, and the erection of the houses will be proceeded with as soon as possible. Each block will consist of a £200 house, to be let at 4s. 10d. per week, with a £150 house at the other end of the block, to let at 3s. 7d., and in the centre two £100 houses, to let at 2s. 5d. per week each. The blocks will be separated by a 13ft. road, and will be sent back from the front road 25ft. The financial part of the scheme has been arranged on the same principle as money lent for artisans' dwellings by the Local Government Board.

New Premises for the Manchester Geographical Society are to be erected in Parsonage.

IDEAL PLUMBING.—V.

By G. A. ALLAN, Plumbing Instructor, Trades Training School.

(Concluded from p. 140, No. 375.)

THE hot-water supply of a house requires to be intelligently designed and skilfully executed so as to obtain the best results whatever system be employed. Very many houses are fitted without any thought being given to the matter by fitters, who do as they have done in other houses and find that in nine cases out of ten the results are passable. In the tenth case the result may be a lamentable failure, simply because some slight change has been made, or should have been made, but that the conditions were not understood.

There are two hot-water supply systems in vogue in England—the tank system and the cylinder system. There is only one system in use in the United States and Canada—the cylinder system. A combination of both systems gives better results than either one used separately.

In small and medium-sized houses the source of heat is the fire in the kitchen range, the boiler being fixed at the back of the firebox, and when the demand for water is not great

the top of the tank is that the hottest water in the tank is at the top and the coldest at the bottom, so when water is drawn off it is drawn from the hottest stratum. In the case of the cylinder, as soon as any water is heated it flows to the top of the cylinder; and as the pipe supplying the taps is connected to the top of the cylinder the water is available for use as soon as heated. For this reason, as there is no connection in the side near the top of stock cylinders, it is better to connect the flow-pipe to the outgo at top, as shown in Fig. 19. By this means the whole cylinderful of water is heated quite as quickly as by the ordinary way of connecting, and before the whole cylinderful is hot what has been through the boiler is available as hot water. As ordinarily connected (see Fig. 20), the hot water passing into such a large body of cold water raises the temperature of the whole, but no hot water is available until the whole cylinderful is heated.

There are three forms of boiler in ordinary use in ranges—the block (Fig. 21), the arched (Fig. 22) and the boot (Fig. 23). Of these the block is the best. Theoretically, it can be proved that either of the other forms is better, but the amount of trouble caused by the welded joint over the arch giving way will counterbalance a good deal of theory. For practical purposes the

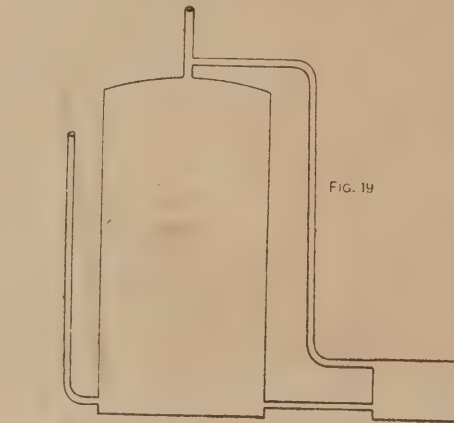


FIG. 19



FIG. 21



FIG. 22

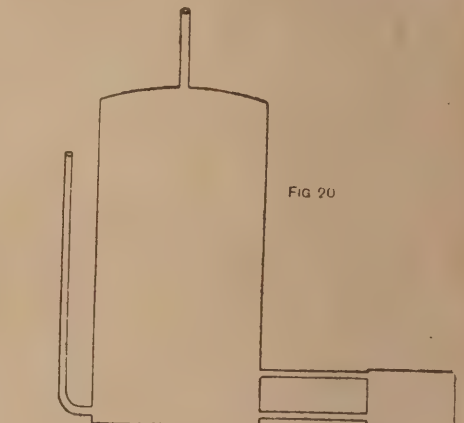


FIG. 20

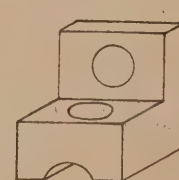


FIG. 23

this arrangement answers very well. In large houses, hotels, schools and institutions where a large amount of water is required it should be heated in an independent boiler. The water is heated in the boiler, and stored in a tank or cylinder. When a tank is used it is generally placed at the top of the building, just below the level of the cold-water cistern. When a cylinder is used it is fixed at the side of the kitchen fireplace. In either case the pipe by which the hot water flows from the boiler to the tank or cylinder is connected to the top or the side close to the top of the boiler, and should be connected to the tank or cylinder at the side near the top, and is called the flow-pipe. As the water in the boiler is heated it expands, and so becomes lighter bulk for bulk, and is displaced by the colder water from the tank or cylinder, which flows along the pipe called the return-pipe. The return-pipe is connected to the tank or cylinder near or at the bottom and to the side of the boiler near the bottom or through the top of the boiler, and prolonged inside for three-fourths of the distance to the bottom. This is to ensure that the circulation shall be in the right direction. If the flow- and return-pipes were both connected to the boiler at the same level the water would still circulate, but indifferently, in either direction. As in the tank system, the draw-off taps are connected to the flow-pipe; if that should be acting as the return, only the coldest water would be available at the taps.

The reason for connecting the flow-pipe near

simpler form lasts longer, is more easily cleaned out, and gives as good results.

There seems to be quite a superstition in England in favour of large boilers, as though the more water that was contained in a boiler the hotter it would get.

In America things are almost carried to the other extreme, and boilers—there called water-backs or water-fronts, the cylinder being always called the boiler—are doing work which English hot-water engineers would not hesitate to assert dogmatically could not be done by boilers so small.

The best arrangement is undoubtedly the independent boiler. It should be of ample capacity for ordinary use, so that on an emergency it can be pushed a little and more work got out of it. The conical form, which consists of a water-jacket round a conical firebox, is the best. The water space should extend down to and under the ashbox. The fire can be regulated by dampers, and so the expenditure of fuel proportioned to the amount of hot water required. The fuel, which should consist of coke, can be supplied for six or eight hours at one time, and the fire can be kept going all night at very little cost. Hot water will then be available for baths early in the morning. All boilers should be fitted with hand-holes for cleaning purposes. Experience will soon teach one how often a boiler using any particular water should be cleaned.

The flow- and return-pipes should be of ample size. The flow-pipe must rise continuously—

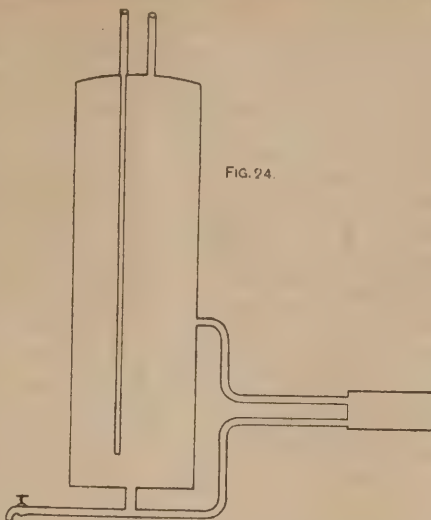
having no dips or traps in it—up to its connection with the tank or cylinder. The return-pipe from the tank should run parallel with the flow-pipe, falling continuously from the tank to the boiler. The return-pipe from the cylinder may rise from its connection to the cylinder to the boiler if the bottom of the cylinder is lower than the bottom of the boiler, and in this case the return connection must be in the side of the boiler near the bottom. If the cylinder is fixed much higher than the boiler the flow- and return-pipes may run parallel. These pipes should be of iron or copper. In America they are frequently of lead, but lead is not a suitable material of which to make pipes conveying hot water.

Lately, when investigating a complaint of water hammer in hot-water pipes it was found that both flow- and return-pipes were of lead run almost horizontally for about 20ft. The pipes were only fastened with hooks, not even being supported on wooden fillets. They had sagged between the hooks until they looked like festoons on the kitchen passage walls.

Hot-water tanks are made of galvanised iron, and cylinders of the same material, or of copper. They are tested up to a certain pressure, depending on the strength of the material. In specifying cylinders or tanks it is better to allow a good margin of safety. The connections to cylinders are usually put on by the makers, and will be placed wherever necessary if the positions be indicated when the cylinders are ordered. The connections, unless specially ordered, are of sizes proportional to the capacities of the cylinders. There are generally four fixed, as shown in Fig. 20. The connections to tanks are made on the job by the fitter, who cuts the holes in the galvanised iron and connects up with boiler screws.

In America cylinders are longer for similar capacities than in England and the connections are placed as shown in Fig. 24. The return-pipe being connected to the bottom is an advantage, as a sediment cock is always fixed, and by drawing off a few pailfuls occasionally the most of the sediment is removed. This cock is also useful for emptying the hot-water system for alterations or repairs, or for leaving the apparatus out of use in winter-time. The sediment cock should have a movable key, which should always be in the charge of some responsible person, or servants are liable to get into the habit of drawing water at this cock, and they may unconsciously empty the cylinder and boiler in the event of the service of water being interrupted. Although it is an open question whether a boiler will explode through having water passed into it while it is red hot, it certainly is not an experiment that should be encouraged in kitchens. In America the sediment cock is generally the ordinary T-handled screw-down bib; and as there is no house-cistern the street-pressure is turned into the cylinder, and yet I never heard of an explosion from too much water having been drawn off. When an accident did happen from this cause it was always a collapse of the cylinder. As the water got low in the cylinder it would boil more readily in the water-back. The steam would collect in the cylinder, expelling the air through any cocks opened in futile attempts to obtain hot water. The cylinder being full of steam, the cold water would suddenly be turned on, the steam would condense, leaving a vacuum, and the atmospheric pressure crushed in the sides of the cylinder like a milk tin under a steam-roller. This is not so likely to happen in England, because the hot-water system at its highest point is open to the atmosphere by means of the expansion pipe; whereas in America there is no expansion pipe, the water being supplied to the cylinder, as already explained, directly from the street mains.

Iron pipes and boilers are only suitable for use with hard water. When the water is soft the boiler should be of copper and the pipes either copper or of tin-lined iron. The cylinder and tank should also be of copper, as this metal is not affected by soft water. It is customary to use plug-cocks for hot water, even when screw-down bibs are used for cold water. But screw-down taps with proper hot-water washers are the best for hot water also. The time saved by using plug-cocks rather than those of a screw-down pattern is like the money saved because a man does not smoke—it amounts to nothing at the



end of the year. A very important fitting in connection with hot-water supply is the safety-valve, and on good work this should never be omitted. There are three varieties of safety-valve—the weighted (dead weight or lever), the spring safety-valve and the disc. The best is the dead-weight, and should be fixed on a pipe leading from the boiler to the front of the chimney-breast above the mantle-shelf. The fitter who cleans out the boiler should be instructed to test the safety-valve each time the boiler is cleaned, and someone in authority should see that this is done. Lately, when investigating the cause of noises in the hot-water pipes, it was found that the sediment and deposit in the boiler reached to within 2in. of the top. After an interval of six months the boiler has just been cleaned again and $\frac{1}{2}$ in. of deposit was taken out. At the same rate of deposition the former lot must have taken seven or eight years to collect, and yet the occupier had been charged for cleaning the boiler half-yearly. So that some trustworthy person must be employed to do the work, and as far possible he should be overlooked.

As has been already stated, the best results are obtained by using both a tank and a cylinder, each to be of half the capacity of either used singly for the same job. The secondary flow-pipe from the cylinder to the tank should be carried close past as many of the more important fixtures as possible, so that the branches may be as short as can be arranged. If any of the branches must be long, a circulation pipe of a smaller diameter than the branches should be carried back to the cylinder, to which it should be connected about 1ft. from the top.

The cylinder and tank should be enclosed and packed with slag-wool or some other non-verminous packing. The hot-water pipes should be covered with a good thickness of some non-conducting material so as to lose as little heat from the water as possible while in process of heating and circulating. The less heat lost by radiation from the pipes and apparatus the more will be contained in the water issuing from the taps. Non-conducting material properly applied will sometimes convert a failure into a success.

The tank and cylinder should both have hand-holes large enough to enable a man to clean them out without inconvenience.

A stop-cock should be fixed between the cold-water cistern and the hot-water tank, and the pipe between them should dip so as to prevent the hot water getting back into the cistern.

The hot-water pipes, like the cold-water pipes, should all be run so that they can be emptied in case the house or any considerable part of it is to be unoccupied in cold weather.

It is customary in many of the "brown stone" mansions of New York to fix all the water-pipes in the kitchen of copper, besides a cylinder of the same material. The New York water is hard, and the copper is only fixed for the sake of appearance. If they are kept polished they look well, but cause an unnecessary amount of work. If they are not kept polished they soon look sadly neglected.

It also became somewhat fashionable to have the supply-pipe to the flushing cistern of water-closet and the flushing pipe of brass, nickel-plated. The supply-pipe when of brass came up

from the floor. Where it came through the floor a nickel-plate brass flange was fixed.

In towns in the United States, in every house down to those having six or seven rooms the bathroom contains a pedestal water-closet and a lavatory basin and a marble slab, besides the bath. And although I have fitted up scores of houses I never once used, either when working for myself or for some employer, a polished-brass bath or lavatory cock. All were nickel-plated except those for the best work, which were heavily silver-plated.

That nickel-plated bath and basin cocks, chains and chain stays, butler's-pantry cocks, &c., look better and are cleaner than brass, there can be little doubt. But whether nickel-plated or polished-copper pipes look better than lead of iron properly treated may well be doubted. It is, after all is said, a matter of taste.

The ordinary bath tub in America is of tinned copper supported by wood, the copper being of thicknesses varying from 12ozs. to 26ozs. to the ft. super. The best baths are the porcelain ones imported from England. Very few iron baths are used. A nobleman's yacht, built on the Tyne, was fitted with baths cut out of the solid marble and brought from Italy. Though this is suggestive of much magnificence, it is very doubtful whether, after they had been in use a couple of years, they would compare favourably with the white-glazed porcelain tubs made in England.

One of the most noticeable differences of life in America from life in England is their prodigal use of water. In London the total used per head of the population, including manufactories, is 30 gals.; in New York it is 80 gals.; and in Washington, with no manufactories at all, it is 180 gals. In America water is considered a necessary, and every man waters his garden, has a sprinkler on his lawn, and uses water according to his taste. In London water is considered a luxury, so that watering flowers in flower pots is forbidden and baths are charged extra.

In many respects the English hold the first place among the nations, but there is no doubt that in the building of comfortable and convenient houses we have still something to learn.

Surveying and Sanitary Notes.

Asphalt Laying.—A "Civil Engineer" writing to the "Times" says: "There is an asphaltier now employed by a London borough council, working apparently to the council's satisfaction, whose daily task consists in laying 20yds. super. of asphalt 1in. in thickness, his wages being 33s. per week. He was formerly employed by a contractor for over twenty years, during which time he usually laid 60yds. super. per diem, occasionally 80yds., and sometimes as much as 100yds. His wages when working for the contractor were 30s. per week, with overtime and expenses, the total averaging 36s. per week. This, I am informed, is by no means an isolated case."

A New Road-Sweeping Machine.—Mr. Fife Scott, of West Croydon, has invented and patented a combined machine to scrape up the refuse by means of an arrangement of brushes and convey it by an ingenious device to a tender in the rear, thus saving a good deal of time now wasted in transferring by means of manual labour the accumulated sweepings from the roadside into carts which follow the sweeper at intervals. The sweeper or scraper can be adapted for either horse, electric or steam-power. In addition, Mr. Fife Scott has devised a cycle sweeper which can be used on the pavements, sweeping the mud into the roadway, where it can be taken up by the larger machines.

R.I.B.A. April Statutory Examinations.—Mr. T. H. Bishop, jun., A.R.I.B.A. (Leighton Buzzard) and Mr. A. Maryon Watson, A.R.I.B.A., B.A. (London, W.), passed these examinations and have been granted certificates of competency to act as district surveyors under the London Building Act.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Shot Towers.

HALIFAX.—H. L. R. writes: "Can you refer me to an illustration of an English shot tower, either brick or stone, in use in England about 1830?"

The shot towers on the banks of the Thames are about 150ft. high, giving a fall of about 130ft. for the shot. A section of a shot tower is given in Vol. III. of "A Treatise on the Progressive Improvement and Present State of the Manufactures in Metal," revised by Robert Hunt (Longman's). A tower in the United States in which the manufacture of shot is carried on is about 180ft. high, 30ft. in diameter at the base, and 15ft. at the top. The melting is conducted at the top in brick furnaces built against the wall, the lead being rained down from a colander through a central opening into a water tank below; the size of the shot is regulated by the mesh of the colander, which is a hollow hemisphere of sheet-iron about 10in. in diameter.

Retaining Walls.

BIRMINGHAM.—STUDENT writes: "What should be the thickness in proportion to the height of a stone retaining wall to support ordinary earthwork (say 25ft. from the base)? Also for a wall of brickwork. To what inclination (in ordinary earth) should earthwork be trimmed off to prevent it moving towards the wall, the top of the earthwork being 20ft. above the level of the top of the wall?"

The thickness of a retaining wall for earth, at the base and one-third the way-up, is usually one-third of the height, and is then reduced towards the top in regular off-sets at the back. The face is made to batter from about 1 in 6 to 1 in 10. We advise you, however, to calculate the correct proportions for your particular purpose from the rules given in Hurst's "Architectural Surveyor's Handbook." See an article on "Service Reservoirs" published in our issue for January 15th last.

Cause of Echo in Church.

BIRTLEY.—B. B. writes: "What is the cause of an echo in a church 60ft. by 36ft. and 22ft. to the top of the walls, and 9ft. more to the ceiling? The principal-legs and collar-beams are below the ceiling line. The vestibule is 14ft. by 8ft. with flat top and 10ft. high inside."

It is very difficult to always account for the cause of an echo in a building, but the reason we should imagine in this case is that the back wall is pierced with only one small opening. The back wall of a large hall should always be broken up with windows and doors as much as possible to prevent the sound-waves being reflected. The balconies usually placed on this back wall serve a most useful purpose in breaking it up and prevent the echo. The arcades in churches serve also to break up the waves. A flat ceiling is also another great cause of echoes, and it is best therefore to let the roof-principals show, but if there are too many the sound is apt to be much deadened and partially lost. Corners and angles should also be rounded. We advise you to try hanging curtains on the back wall to deaden the waves.

Makers of Church Bells.

GLASGOW.—J. B. W. writes: "Where can I get the best church bells? I want a single bell of moderate weight, but of fine tone and good carrying power. Price is not so important as quality."

Mears & Stainbank, of 34, Whitechapel Road, E., are, we believe, the oldest established firm of bell-founders, but Messrs. John Warner & Son, Ltd., 2, Jewin Crescent, Cripplegate, E.C., and Mr. James Barwell, Great Hampton Street, Birmingham, are well known. We consider several English firms of bell-founders are as good as any on the Continent.

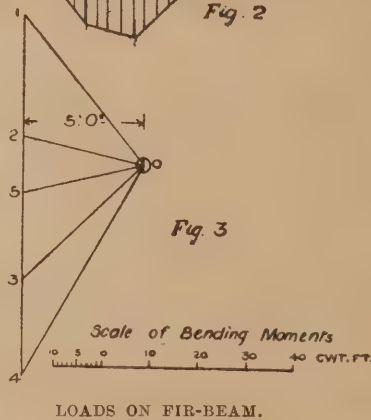
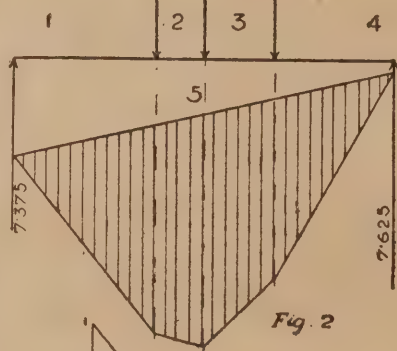
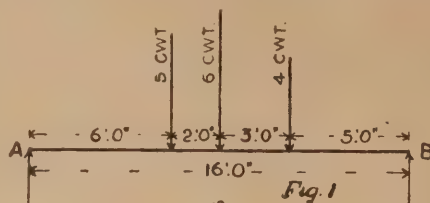
Scantlings of Fir-Beam.

LONDON.—A PUZZLED SUBSCRIBER writes: "What must be the scantlings of a fir-beam to carry a central load of 6 cwt., a load of 5 cwt. 6ft. from one end, and a load of 4 cwt. 5ft. from the other, the span of the beam being 16ft.? I have tried four or five methods, but each gives a different result."

Mathematically, the simplest method of finding the equivalent central load is to first find the reactions of the side loads at the opposite ends; thus $5 \times \frac{6}{16} = 1.875$, reaction of 5 cwt. load

at B (Fig. 1), and $4 \times \frac{5}{16} = 1.25$, reaction of 4 cwt.

at A. The reaction from central load is self-evident = 3. Then the bending moment in



LOADS ON FIR-BEAM.

the centre from all the loads combined will be $8(3 + 1.875 + 1.25) = 49$ ft. cwt., which divided by 4 gives the equivalent central load = $\frac{49}{4} = 12.25$ cwt.

This safe load in cwt. distributed on a fir-beam is given by the formula $\frac{bd^2}{L}$, where b and d are breadth and depth in inches and L span in feet. A distributed load only affects a beam half as much as a central load, therefore $\frac{bd^2}{L} = 12.25 \times 2$; but $L = 16$ ft.; therefore $bd^2 = 12.25 \times 2 \times 16 = 392$.

Assume $b = 6$, $d = 8$ then $bd^2 = 6 \times 8^2 = 384$, which is so nearly the required value that it may be considered sufficient, especially as the formula allows a factor of safety of 7. The graphic working of this question would be as shown in Figs. 2 and 3 for the bending moments, and the remaining particulars will then be calculated as above, graphic construction not being suitable.

HENRY ADAMS.

Strength of Stone Staircase and Landing.

WORKING.—A. A. M. writes: "I send a tracing of a landing of a stone staircase (not reproduced). The tenant is doubtful of its stability, though it

has been up for 100 years. What is your opinion with regard to it?"

The landing or gallery appears to be the weakest part. Take 1ft. run. Let w = load lbs. per sq. in.; l = span in inches; z = modulus of section; c = ultimate strength of material in tension, say 1,000 lbs. per sq. in.; d = depth or thickness in inches; b = breadth of part under notice = 12in. Then bending moment = moment of rupture—

$$\begin{aligned} M &= R, \\ w l^2 &= z c, \\ \frac{2}{3} w l^2 &= \frac{b d^2}{6} c, \\ \text{whence } w &= \frac{c b d^2}{3 l^2} \end{aligned}$$

$$\begin{aligned} \text{whence } w &= \frac{c b d^2}{3 l^2} \\ &= \frac{1000 \times 12 \times 4.375^2}{3(4.5 \times 12)^2} \\ &= 26.25 \text{ lbs. sq. in.} \end{aligned}$$

and $26.25 \times 144 = 3780$ lbs. per sq. ft., less $130 \times \frac{4.375}{12} = 47.4$ weight of stone, $3780 - 47.4 = 3732.6$, and, allowing a factor of safety of 6, $\frac{3732.6}{6} = 622$ lbs. per ft. super. safe external load, assuming the stone to be sufficiently tailed into the wall and the brickwork to be sound. The gallery has therefore ample strength.

HENRY ADAMS.

Stone Church, Kent.

RICHMOND.—ENQUIRER writes: "Kindly give me a few particulars of this church. I have made several enquiries for these particulars from various sources, but have had no satisfactory information."

See pages 106, 117 and 129 of our issues of September 20th and 27th and October 4th, 1899.

Perrault's "Vitruvius."

LONDON, S.E.—PUPIL writes: "What is the value of Perrault's French version of Vitruvius published in 1673? I have it in the original binding, with all the plates intact."

The book is only worth 3s. or 4s. Mr. Batsford does not care to purchase it.

Arranging Bedrooms on Plans.

TEIGNMOUTH.—REX writes: "I send a sketch of a part of a plan and elevation for a house showing front bedrooms and roof (not reproduced). One bedroom is larger than the other. If, therefore, I have the two gables the same span, they will have no 4½in. wall in the middle to rest on. If you can think of any idea for getting out of this difficulty, I shall be grateful."

The enquiry shows to what lengths the foolish demand for symmetry can be carried. When there is a difference of function, uniformity is wrong, and if the sizes of the bedrooms are unalterable to distort the elevation would be false, but it appears to us that the extra width of the bedroom is not needed, and the plan could be rearranged to get the bedrooms, which have a similar function, symmetrical. If, however, the conditions are unalterable, it is only right that the roofs should show the difference by one being larger and higher than the other. It is by such direct outward expression of the plan that most old buildings obtain their interest and beauty. Parts should always be proportioned to their work.

Rough-Cast.

DERBY.—DERVENTIO writes: "What is the formula for a rough rendering that will weather well and remain white?"

See p. 440 of our issue for January 9th, 1901.

Books on Perspective and Geometry.

MOSELEYS.—A. D. writes: "Which books on the projection of solids, descriptive geometry, are most suitable to study for the R.I.B.A. Intermediate Examination?"

"Practical Plane Geometry" and "Descriptive Geometry" by J. F. Heather, and E. A. Davidson's "Elements of Practical Perspective." These can be obtained from Mr. B. T. Batsford 94, High Holborn, W.C.

Masters and Men.

Working Hours in Hull.—A conference has taken place between representatives of the Hull master-builders and their employees for the purpose of deciding upon an amended code of working hours during the winter months and also a revision of the starting-places.

An Arbitration between the Operative House Painters and Master-Painters' Association of Manchester, Salford and District, held before Mr. J. W. Roe Rycroft on March 25th, has resulted in a slightly changed code of working rules and an increase of a farthing an hour on the present rate of wages. The new rules are to come into operation on May 1st.

The Penrhyn Quarries.—Mr. E. A. Young, writing from Port Penrhyn, Bangor, states that the workmen in the Penrhyn quarries now number 843, and the average wage for the last two months reached the highest on record, viz., 6s. 9d. per day for the month ended the 18th of March, and 6s. 11½d. per day for the month ended the 15th of April. In some cases labourers have earned as much as 5s. per day and upwards.

Leigh, Atherton and Tyldesley Plasterers, numbering about forty, went on strike last May because the masters refused to advance their wages from 9d. to 10d. an hour. Some months later the men offered to resume work for an immediate advance of a halfpenny per hour and another halfpenny in six months. This also was refused. The men have now agreed to immediately resume work at the old rate of wages, and work with the men imported from elsewhere, the masters agreeing to reconsider the wages question next November, and work has been resumed.

Sheffield Timber Trade Dispute.—Although the strike in the Sheffield timber trade is not general, a fairly large number of men have ceased work. No united action is being taken by the timber merchants in the city. The conditions of employment vary in different yards, and in some cases notices have not been handed in by the men. A letter sent out by the Union interested in the strike demands a week of 52 hours, the men to leave at noon on Saturdays. A minimum rate of wages for various grades of 6½d., 7½d. and 8d. per hour is also demanded, and the following payment for overtime: First two hours, time and a quarter; next two hours, time and a half, and from this period until starting time next morning, and Sundays and Christmas Day, double time. But no overtime be paid until fifty-two hours have been worked. Another condition demanded is that one apprentice be allowed to every two men, but not more than four apprentices in one shop.

Trade and Craft.

A Well-Known Firm.

The works of Messrs. Stanley Brothers, Ltd., of Nuneaton, are situated within a short distance of the home of "George Eliot," in the midst of the scenes she so graphically describes; for here on the one side is "Paddiford," but little altered from the days of the writer, while "Milby" lies in the valley in the distance and "Shepperton" Old Church raises its grey pile to the skies. In 1857 the works were in the hands of four different parties, who directed their attention to the manufacture of blue bricks, glazed pipes and roofing tiles only. Shortly after, Mr. Broadbent and Mr. Jacob Stanley took a lease of one of the small yards, and in the same year—on his return from America—Mr. Reginald Stanley joined the firm. Mr. Broadbent's connection, however, was not a long one, failing health causing his retirement, and Mr. Jacob Stanley withdrew a year or two afterwards. In the course of time, as the manufactures of the firm became more widely known, four adjoining yards were acquired as they came into the market. Thus the basis was formed of what in after years became an extensive industry, as the manufacture of ridge tiles and finials, paving tiles, chimney pots, glazed sinks, white and coloured glazed bricks and a variety of other goods was introduced. Some years later, owing to the increase in demand for blue goods manufactured by the company, it was found necessary to further develop the

blue clays in the neighbourhood, and a large area was leased and new works were erected on the most modern principles. Mr. Stanley has invented special machinery for different classes of goods, among which may be mentioned a steam press for malt-kiln tiles (a speciality for which the firm has a wide reputation); two kinds of steam presses remarkable for the strong and even pressure they apply; a steam kitchen sink press which at one operation forms the sink from a clot of clay, so that it is free from cracks and flaws; and a steam machine known as the multiplex vertical die-press, which greatly reduces the cost and improves the quality of the goods. The works and clay fields now cover an area of about 200 acres, extending over a mile in length. In 1895 it was decided to convert the business into a limited company, under the style of Stanley Brothers, Ltd., and the dividends since paid have given the shareholders every cause for satisfaction. Prior to the conversion, branch works were secured at Burslem (Staffs) and Willenhall (near Coventry). The company are also proprietors of the Nuneaton Colliery and the Charity Collieries, Bedworth, which is a distinct advantage, seeing that the consumption of fuel at the Nuneaton Works alone exceeds 60,000 tons annually.

New Patents.

These patents are open to opposition until June 3rd.

1901.—Fireproof Floors.—7,122. H. J. YOUNG, 16, Balham Park Road, Balham, London, S.W. The bottom flanges of the joists are protected by a deep casing (preferably made in two halves) which gives considerable air-space. Corrugated tiles are laid between the joists and concrete is filled in above.

Hinges.—7,827. W. DEFRIES, 147, Houndsditch, and V. I. FEENEY, 60, Queen Victoria Street; London. The hinge has a double conical pin with a central ball-shaped boss, which fits in cup-shaped recesses of the hinge flaps, and so provides a ball bearing.

Ventilators.—8,118. R. BOYLE, 64, Holborn Viaduct, London, E.C. The ventilator has a bell-mouth which is continued upwards, and then returned downwards to communicate with the downcast shaft, a deflector being provided at the bend. The object is to keep out snow, rain and hail.

Operating Windows, Fanlights, &c.—9,317. H. C. PRICE, ALBERT BROWN & CO., Smallbrook Street, Birmingham. The windows, fanlights, doors, &c., are opened or closed by means of compressed air, which actuates suitable pistons. A special shunt-valve is employed.

Crushing Mills.—13,643. H. H. LAKE, 45, Southampton Buildings, London, W.C. (communicated by PICCARD, PICTET & CO., 9, Route de Lyon, Geneva). The drum into which the raw material is fed contains a series of vertical lens-shaped rollers having no pivots or axes, but so arranged that they crush the material one after another.

"Buttons" for Kilns.—23,488. M. J. ADAMS, 72, Park Lane, Leeds. When articles are set in a kiln one on another they are separated by glazed buttons fired at a greater heat so that they do not stick.

The following specifications were published on Thursday last, and are open to opposition until June 9th. A summary of the more important of them will be given next week. The names in italics are those of the communicators of the inventions.

1901.—6,382, BULEY, hot- and cold-water bath fittings. 6,754, TIPPETS, obtaining uniform flow from reservoirs, sewers, &c. 6,895, NEWTON (O'Brien), pipe-joint pouring apparatus. 7,178, HUGHES, kilns. 7,674, SEAMAN, pumps. 8,519, ADAMS, opening and closing fanlights, doors, &c. 9,892, CARTER, artificial stone. 10,447, STANLEY & TALLACK, surveyors' levels. 10,978, PRICE, centering for concrete floors, arches, &c. 11,275, DAVIES, cutting-off tables and push-plates of brick machines. 16,296, RINGEL, swimming baths. 16,433, THIRION, grinding mills. 18,883, DEL MARMOL, furnaces, fireplaces &c. 22,267, TEALE, domestic firegrates.

1902.—1,488, WADSWORTH, hoists. 1,638, LA DOW, joints. 3,426, BROOKES (*Fiske*), brick kilns.

CURRENT MARKET PRICES.

FORAGE.			
		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	—
Clover, best ..	per load	4 15 0	5 10 0
Hay, best	do.	5 5 0	6 12 6
Sainfoin mixture ..	do.	4 10 0	5 5 0
Straw	do.	1 8 0	2 0 0
OILS AND PAINTS.			
Castor Oil, French ..	per cwt.	1 5 8	1 6 10
Coiza Oil, English ..	do.	1 6 8	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 9 6	—
Lead, white, ground, carbonate ..	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels ..	do.	1 10 9	—
Petroleum, American ..	per gal.	0 0 6½	0 0 7
Do. Russian	do.	0 0 5½	0 0 6½
Pitch	per barrel	0 7 0	—
Shellac, orange	per cwt.	5 19 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Meat ..	per cwt.	1 10 6	1 11 0
Tar, Stockholm	per barrel	1 2 6	—
Turpentine	per cwt.	1 12 7½	—
METALS.			
Copper, sheet, strong ..	per ton	69 0 0	—
Iron, Staffs., bar	do.	6 7 6	8 10 0
Do. Galvanised Corrugated sheet ..	do.	12 0 0	12 7 6
Lead, pig, Soft Foreign ..	do.	11 15 0	—
Do. do. English common brands	do.	12 0 0	—
Do. sheet, English 3½ per sq. ft. and upwards ..	do.	13 0 0	—
Do. pipe	do.	13 10 0	—
Nails, cut clasp, 3 into 6 in. ..	do.	9 0 0	—
Do. floor brads	do.	8 15 0	—
Steel, Staffs., Girders and Angles	do.	5 15 0	6 5 0
Do. do. Mild bars	do.	6 10 0	7 0 0
Tin, Foreign	do.	129 0 0	129 10 0
Do. English ingots	do.	130 0 0	131 0 0
Zinc, sheets, Silesian ..	do.	21 0 0	—
Do. do. Vieille Montaigne ..	do.	21 10 0	—
Do. Spelter	do.	18 2 6	18 7 0
TIMBER.			
SOFT WOODS.			
Fir, Dantzic and Memel ..	per load	2 1 0	—
Pine, Quebec, Yellow ..	per load	4 7 6	8 0 0
Do. Pitch	do.	2 14 0	3 11 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 10
Do. Petersburg ..	per bundle	0 8	—
Deals, Archangel 2nd & 1st per P. Std.	do.	16 15 0	24 15 0
Do. do. 4th & 3rd ..	do.	10 15 0	12 5 0
Do. do. unsorted ..	do.	5 12 6	6 10 0
Do. Riga	do.	6 15 0	12 10 0
Do. Petersburg 1st Yellow ..	do.	16 5 0	—
Do. do. 2nd	do.	8 10 0	13 15 0
Do. do. White	do.	7 5 0	12 10 0
Do. Swedish	do.	8 15 0	14 15 0
Do. White Sea	do.	13 5 0	17 5 0
Do. Quebec Pine, 1st ..	do.	29 15 0	—
Do. do. 2nd	do.	11 15 0	12 5 0
Do. do. 3rd & 4th ..	do.	9 10 0	—
Do. Canadian Spruce, 1st ..	do.	7 10 0	12 10 0
Do. do. 3rd & 2nd ..	do.	7 5 0	9 15 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	7 0 0	10 5 0
Flooring Boards 1 in. prepared, 1st ..	per square	0 8 9	0 16 6
Do. 2nd	do.	0 9 3	0 10 6
Do. 3rd & 4th	do.	0 7 9	0 8 9

OUR INSURANCE SCHEMES.

A Pamphlet, giving full details of the **THREE SCHEMES**, will be sent on application to

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SPECIAL NOTICE.

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
May 1	Wickford, Essex—Pair of Cottages	—	F. Whitmore, Architect, Chelmsford.
" 1	Exeter—Rebuilding Hotel	—	E. H. Harbottle & Son, Architects, County Chambers, Exeter.
" 1	Dublin—Additions to Hospital	—	A. B. Bruntz, 1 College Street, Dublin.
" 1	Abertillery, Wales—Twenty-two Double Cottages	Building Club	G. O. Hillard, Architect, Market Chambers, Abertillery.
" 1	Aspatia, Cumberland—Two Houses	W. Thompson & J. Moore	R. Berwick, 35 Lawson Street, Aspatia.
" 1	Chelmsford—Pair of Cottages	—	F. Whitmore, Architect, Chelmsford.
" 1	Coventry—Tables, Seats, &c., at Drill Hall	Volunteer Corps	J. E. Swindlehurst, St. Mary's Hall, Coventry.
" 1	Ripon—Masonic Lodge, &c.	—	W. Steel, Secretary to Building Committee, Blossomgate, Ripon.
" 1	South Molton, Devon—Dwelling House	—	J. E. Dansem, 1 King Street, South Molton.
" 1	Glasgow—Jobbing Work and Materials	Corporation	Office of Public Works, City Chambers, 54 Cochrane Street, Glasgow.
" 1	Erdington—Church Schoolrooms	—	Ingall & Son, 3 Temple Row West, Birmingham.
" 1	Great Boughton—House, &c.	J. Naithy	G. W. Weatherill, Architect, Stokesley.
" 2	Inverness—Additions to Slaughter-house	—	Borough Surveyor, Inverness.
" 2	Reading—Alterations, &c., to Hospital	Royal Berkshire Hospital	Rualt & Young, 17 Southampton Street, Bloomsbury.
" 2	Bridgend—Kitchen, Laundry, Boiler House, &c.	Guardians	P. J. Thomas, Architect, Bridgend.
" 2	Easingwold, Yorks—Detached Dwelling-House	—	J. F. Todd, Architect, Uppley, Easingwold.
" 2	Fintray, Scotland—Alterations, &c., to Houses	—	A. Stronach, Junr., & Son, 20 Belmont Street, Aberdeen.
" 2	Harrington, Spilsby—Brick Barrel Tunnel	Spilsby Rural District Council	T. A. Busbridge, District Highway Surveyor, Spilsby.
" 2	Hastings—Iron Building at Fish Market	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
" 2	Llandaff—Residence	—	J. W. Rodger, 14 High Street, Cardiff.
" 2	Wrexham—Offices, Agent's Residence, &c.	Miners Federation Trustees	Davis & Moss, 2 Temple Row, Wrexham.
" 2	Hebden Bridge—Dyeworks, &c.	—	Sutcliffe & Sutcliffe, Architects, Todmorden.
" 3	Falmouth—Boating Cottage	J. Crossman	H. W. Collins, 23 Church Street, Falmouth.
" 3	Uttoxeter, Staffs—Grand Stand, &c.	Staffordshire Agricultural Society	J. P. Jones, Secretary, Newcastle, Staffs.
" 3	Ventonleague, Hayle, Cornwall—Enlargement of Church	—	S. Hill, Architect, Green Lane, Redruth.
" 3	St. Agnes—Residence	—	G. O. Hancock, Junr., Solicitor, St. Agnes.
" 3	Sully, near Cardiff—Residence, &c.	A. T. Stephens	Veall & Sant, Architects, Cardiff.
" 3	Chadwell Heath, Essex—Farm Buildings at Asylum	West Ham Borough Council	Borough Engineer, Town Hall, West Ham, E.
" 3	Daisy Hill, Bradford—Two Villas	—	J. W. C. Atkinson, 1 Ivegate, Bradford.
" 3	Neath—Organ-Chamber, Fourteen Classrooms, &c.	Baptist Connexion	J. C. Rees, Architect, Neath.
" 3	Dublin—Addition to Branch Library	Corporation	City Architect, Municipal Buildings, Cork Hill, Dublin.
" 5	Denholme—Three Houses, &c.	—	G. H. Knowles, Architect, Old Bank Chambers, Keigley.
" 5	Glasgow—Lime, Cement, Bricks, &c.	Sewage Department	T. Melvin, General Manager, Sewage Wks., Swanston St., Glasgow.
" 5	Wallington, Surrey—Seven Shops and Houses	—	Warren & Stupart, 385 Green Lanes, Harringay, N.
" 5	Aberporth, Wales—House and Outbuildings	—	D. Morris, Land Surveyor, Cardigan.
" 5	Burton-on-Trent—Dwellings, Cottages, Fire Station, &c.	Corporation	Borough Surveyor, Burton-on-Trent.
" 5	Bradford—Alterations, &c., to Board School	School Board	Board's Architect, Manor Row, Bradford.
" 5	Harrington, Cumberland—Alterations, &c., to House	T. Rutherford	W. G. Scott & Co., Architects, Victoria Buildings, Workington.
" 5	Mountain Ash, Wales—Additions to Stores	—	Morgan & Elford, 1 Jeffrey Street, Mountain Ash.
" 5	Norwich—Brick and Concrete Retaining Wall	Corporation	A. E. Collins, City Engineer, Guildhall, Norwich.
" 5	St. Stephen's-by-Saltash, Cornwall—Plastering	Town Council	H. Bowden, Builder, Cross Park, St. Stephens-by-Saltash.
" 5	Dartmouth—Ripping Stone at Quarry	Corporation	A. Smith, Borough Surveyor, Victoria Road, Dartmouth.
" 5	Huddersfield—Foundations at Electricity Works	Bangor Urban District Council	Borough Electrical Engineer, Works, St. Andrew's Rd., Huddersfield.
" 6	Skippingstone, Bangor—Bathing Houses	Co-op. Industrial and Provident Soc., Ltd.	E. L. Woods, Town Surveyor, Town Hall, Bangor.
" 6	Trowbridge—Machine Bakery	Cleansing Committee	W. W. Snailum, Architect, Church Street, Trowbridge.
" 6	Bradford—Cement, Lime, &c.	Corporation	E. Call, Assistant Superintendent, Hammerton St. Depot, Bradford.
" 6	Leeds—Foundations and Side Walls to Greenhouses	—	City Engineer, Leeds.
" 6	Llandaff—Residence	Urban District Council	J. W. Rodger, 14 High Street, Cardiff.
" 7	Leek, Staffs—Cement, Lime, &c.	—	J. Myatt, Town Surveyor, Town Hall, Leek.
" 7	Callington, Cornwall—Chapel	Urban District Council	Rev. J. Datson, Launceston Road, Callington.
" 7	Weston-Super-Mare—Ward, &c., at Fever Hospital	Steam Shipping Co., Ltd.	H. Nettleton, Surveyor, Town Hall, Weston-Super-Mare.
" 7	Goole—Block of Offices	Town Council	G. W. Atkinson, 1 Mark Lane, Leeds.
" 7	Leith, Scotland—3 Buttresses, Stairs, &c., at Sea-Wall	Electric Light and Power Committee	Borough Surveyor, Town Hall, Leith, Scotland.
" 7	Colchester—Boiler and Engine Houses	Co-operative Society	H. Goodyear, Borough Engineer, Town Hall, Colchester.
" 8	Chesterfield—Stores, &c.	—	G. Haslam & Son, Euclid House, Ilkeston.
" 8	Leeds—Foundations and Side Walls to 5 Greenhouses	St. Pancras Parish Guardians	City Engineer, Leeds.
" 8	London, N.W.—Receiving Home for Children	County Council	A. E. Pridmore, 2 Broad Street Buildings, E.C.
" 8	Londonderry—Alterations, &c., to Court House	Fulham Borough Guardians	County Surveyor, Court House, Londonderry.
" 9	London, S.W.—Relaying Ward Floors	Commissioners of H.M. Works	E. J. Mott, Clerk, Fulham Palace Road, Hammersmith, W.
" 9	Birmingham—Repair, &c., to Buildings	Asylum Committee	Assistant Architect, H.M. Office of Works, Pinfold St., Birmingham.
" 10	Bundoran, Ireland—Rebuilding House	Very Rev. Canon Shortall	W. S. Jervois, Architect, Armagh.
" 10	Derby—Asylum Extension	Rural District Council	B. S. Jacobs, Architect, Lincoln's Inn Buildings, Bowdley Ln., Hull.
" 10	Durrow, Ireland—Completing Church Tower, &c.	Leicestershire County Council	W. H. Byrne, 20 Suffolk Street, Dublin.
" 10	Uxbridge—Sunday Schools	Urban District Council	Heron & Blairs, and W. L. Ever, High Street, Uxbridge.
" 10	Aberystwyth—Stone Bridge over River Peris	School Board	H. Hughes, 8 Market Street, Aberystwyth.
" 10	Loughborough—Extensions, &c., to Police Court	Llandebie School Board	S. P. Pick, 6 Millstone Lane, Leicester.
" 12	Bishop's Stortford—Additions to Offices	Great-Western Railway Co.	R. S. Scott, Surveyor, North Street, Bishop's Stortford.
" 12	Walsall—Alterations and Additions to Schools	Urban District Council	Bailey & McDonald, Architects, Bridge Street, Walsall.
" 13	Mynydderig, Wales—School	Management Committee	D. Jenkins, Architect, Llandilo.
" 13	Pontypool—Transfer Shed	Corporation	Engineer, Newport Station.
" 13	Mytholmroyd—Retaining and Fence Wall	St. Pancras Borough Council	S. Sutcliffe, Surveyor, Council Offices, Mytholmroyd.
" 13	Donabate, co. Dublin—Gate Lodge, Cottages, &c.	Corporation	G. Lennon, Clerk, Richmond Asylum Offices, Grange-gorman, Dublin.
" 13	Kingston-on-Thames—Dust Destructor Buildings	Corporation	Borough Surveyor, Clatterton House, Kingston-on-Thames.
" 13	London, N.W.—Power Station and Sub-Station	Corporation	Electricity Department Offices, 57 Pratt Street, N.W.
" 14	Middlesbrough—Cement, Bricks, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
" 14	Jarrow—Municipal Buildings	Corporation	F. Reynolds, 37 King Street, South Shields.
" 15	London, S.W.—Carpenter's and Joiner's Work	Admiralty	Director of Navy Contracts, Admiralty, S.W.
" 17	Wick and Lybster—Station Offices, Houses, Sheds, &c.	Highland Railway Company	W. Roberts, Company's Engineer-in-Chief, Inverness.
" 22	Whitby, Yorks—Dwelling, Fog Signal House, &c.	Trinity House	Corderoy, Sely & Corderoy, 21 Queen Anne's Gate, Westminster.
" 22	Charminster—House for Private Patients at Asylum	—	G. T. Hine, 35 Parliament Street, S.W.
June 14	Castlebar—Extensions to Asylum	—	J. T. Kelly, Clerk, Lunatic Asylum, Castlebar.
no date	Apperley Bridge—Sunday School	—	Dauby & Simpson, 10 Park Row, Leeds.
"	Ilkley—Sunday School	—	Garside & Pennington, Architects, Pontefract.
"	Outwood, nr. Wakefield—Parochial Institute & Schools	—	B. Wilson & Oglesby, 12 East Parade, Leeds.
ENGINEERING:			
May 1	Sudbury, Suffolk—Electrical Plant	Corporation	W. B. Ransom, Town Clerk, Town Hall, Sudbury, Suffolk.
" 1	Leeds—Hot-Water Apparatus	District Council	Part-Superintendent, Roundhay, Leeds.
" 1	Bathmies, Ireland—Engine-house Plant, &c.	Corporation	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 1	Mansfield—Electrical Plant	Stepney Borough Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 1	London, E.—Electric Meters, &c.	London County Council	W. O. B. Tapper, 27 Osborn Street, E.
" 1	London, S.W.—Electric Wiring and Fittings	Urban District Council	Chief Engineer's Department, County Hall, Spring Gardens, S.W.
" 1	Leiston-cum-Sizewell, Suffolk—Waterworks	Rural District Council	H. Miller, 16 Museum Street, Ipswich.
" 1	Pontefract—Flushing Chambers	Rural District Council	Clerk, Council Offices, Union Offices, Pontefract.
" 1	Tynemouth—Sanitary Pipes, &c.	Urban District Council	A. S. Dinning, 21, Ellison Place, Newcastle.
" 1	Witham, Essex—Sinking, Boring, &c.	Guardians	W. B. Blood, Clerk, Council Offices, Witham.
" 2	Bridgend—Steam Laundry Machinery, &c.	Urban District Council	P. J. Thomas, Architect, Bridgend.
" 2	Otley, Yorks—Laying Main	Rural District Council	J. Waugh, Engineer, Sunbridge Chambers, Bradford.
" 2	Yeovil—Reservoir, Engine House, &c.	Yeovil Rural District Council	J. E. Rodder, 30 Kingston, Yeovil.
" 2	South Petherton—Waterworks	Tramways Committee	J. E. Rodder, Clerk, 30 Kingston, Yeovil.
" 3	Manchester—Tramway Track Work	Rural District Council	J. M. McIlroy, 55 Piccadilly, Manchester.
" 3	Tadcaster—Water-Supply Works	Corporation	Bromet & Thorman, Engineers, Tadcaster.
" 3	Glasgow—Engine	Urban District Council	D. H. Morton, 130 Bath Street, Glasgow.
" 3	Cleckheaton—Electric Motors	Waterworks	J. Armitage, Town Hall, Cleckheaton.
" 3	Pitlochry, Scotland—Water Basin	Tramways Committee	W. Bell, Engineer, Aberfeldy.
" 3	Manchester—Tramway Track Work, &c.	Fulham Borough Council	J. M. McIlroy, 55 Piccadilly, Manchester.
" 5	London, S.W.—Electrical Plant	Corporation	M. H. Medhurst, 13 Victoria Street, S.W.
" 5	Burton-on-Trent—Reconstruction of Bridge	Corporation	Borough Surveyor, Burton-on-Trent.
" 5	Manchester—Locomotive	Rivers Committee	Secretary, River's Department, Town Hall, Manchester.
" 5	Manchester—Valves, &c.	Waterworks Committee	G. H. Hill & Sons, 3 Victoria Street, Westminster.
" 6	Olunham—Switchboards	Corporation	A. Andrew, Gas and Water Offices, Oldham.
" 6	High Wycombe & Princes Risborough—Widening Rly. &c.	Great Western & Great Central Railways	Engineer of Great Western Railway, Paddington Station.
" 6	Princes Risborough and Grendon Underwood—Railway	Electric Lighting Committee	Engineer of Great Central Railway, London Road Station, Manohtr.
" 7	Sydney, N.S.W.—Electrical Plant, &c.	—	Preece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 7	Aberdeen—Electrically-Driven Crane	—	J. A. Bell, City Electrical Engineer, Oulton Street, Aberdeen.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
May 7	Selkirk—Intake Works	Town Council	H. W. Taylor, St. Nicholas's Chambers, Newcastle-on-Tyne.
" 7	Swinton, Lancs.—7 Bacteria Beds	Urban District Council	H. Entwistle, Surveyor, Council Offices, Swinton.
" 7	Withnell, Lancs.—Waterworks	Urban District Council	T. Beaver, Surveyor, Council Offices, Brinscall.
" 8	Llangattock, near Orickhowell—Waterworks	Rural District Council	T. Rees, Corn Exchange Chambers, Newport, Mon.
" 8	Bury—Tramway Cables	Corporation	Lacey, Clirehugh & Sillar, 78 King Street, Manchester.
" 9	Stapleford, near Hertford—Rebuilding Bridge	Hertford Rural District Council	J. Farley, Surveyor, Old Cross, Hertford.
" 13	West Ham—Eight Transformer Chambers	Borough Council	Borough Engineer, Town Hall, West Ham.
" 13	Drogheda, Ireland—Reservoir, &c.	Gas and Water Committee	L. Donegan, Secretary, Gas and Water Offices, Drogheda.
" 13	Dublin—Subway	Lighting Committee	S. Hart, City Engineer, City Hall, Dublin.
" 13	West Ham—Machinery	Town Council	J. K. Bock, Borough Electrical Engineer, Abbey Mills, West Ham.
" 14	Hull—Bridge Abutments, Retaining Walls, &c.	North-Eastern Railway Co.	T. M. Newell, Engineer, Dock Office, Hull.
" 21	Darlington—Gasholder	Corporation	Gas Engineer, Gasworks, Darlington.
June 2	Alexandria, Egypt—Beacon Buoys, &c.	Ports and Lighthouses Administration	Controller-General, Ports and Lighthouses, Alexandria.
IRON AND STEEL:			
May 2	Wallsend—Fencing and Gates	Corporation	G. Hollings, Borough Surveyor, Wallsend.
" 2	Leek, Staffs.—Cast-Iron Pipes	Urban District Council	C. Henshaw, Clerk, Town Hall, Leek.
" 2	Spilsby, Lincs.—Tools	Rural District Council	T. A. Busbridge, District Surveyor, Spilsby.
" 3	Wrexham—Electrical Stores	Town Council	Borough Electrical Engineer, Willow Road, Wrexham.
" 5	Glasgow—Iron Castings, &c.	Sewage Department	T. Melvin, General Manager, Sewage Works, Swanston St., Glasgow.
" 6	Bradford—Iron, Steel, Bolts and Nuts	Cleansing Committee	E. Call, Assistant Superintendent, Hammerton St. Depot, Bradford.
" 6	Hove, Sussex—Lamp-Post, &c.	Town Council	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 7	Burton-on Trent—Manhole Covers	Urban District Council	G. T. Lynam, Borough Surveyor, Town Hall, Burton-on-Trent.
" 7	Leek, Staffs.—Cast-Iron Gulleys, Manhole Covers, &c.	Urban District Council	J. Myatt, Town Surveyor, Town Hall, Leek.
" 14	Middlesbrough—Lamp-Post, Iron and Steel, Pipes, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
" 15	Rochester—Cast-Iron Socket Pipes, &c.	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
" 15	Leeds—Cast-Iron Pipes	Corporation	City Engineer, Leeds.
PAINTING AND PLUMBING:			
May 1	Glasgow—Painter, Gasfitter and Plumber Work	Corporation	Office of Public Works, 64 Cochrane Street, Glasgow.
" 3	Milnrow, Lancs.—Painting & Repairing Reform Club	Sewage Department	J. Stott, Secretary, Reform Club, Milnrow.
" 5	Glasgow—Paints, Oils, &c.	Town Council	T. Melvin, General Manager, Sewage Works, Swanston St., Glasgow.
" 6	Hove—Painting Lamp Posts, &c.	War Department	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 7	North Aldershot—Painting and Colouring, &c.	School Board	C. L. Young, Royal Engineer Office, North Aldershot.
" 10	Glass Houghton—Cleaning, Whitewashing, &c., School	School Board	V. Hulme, Clerk, County Chambers, Bradley Street, Castleford.
" 13	Croydon—White Lead, Oils, Colours, &c.	School Board	B. Rule, Clerk, Offices, Oathorne Street, Croydon.
" 14	Middlesbrough—Oils, Paints, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
ROADS AND CARTAGE:			
May 1	London, W.—Road Works	Ealing Town Council	O. Jones, Borough Engineer, Town Hall, Ealing, W.
" 1	Hartlepool—Road Materials	Rural District Council	W. Burton, Road Surveyor, Billingham, via Stockton-on-Tees.
" 1	Glasgow—Paving Works and Materials	Corporation	Office of Public Works, City Chambers, 64 Cochrane St., Glasgow.
" 2	Ashford, Kent—Broken Granite	Urban District Council	W. Terrill, Surveyor, North Street, Ashford, Kent.
" 2	Eastbourne—Materials, &c.	Rural District Council	T. E. Kiotlan, 82 Terminus Road, Eastbourne.
" 3	Felixstowe—Kerbing, &c.	Urban District Council	S. E. Fisher, Surveyor, Town Hall, Felixstowe.
" 3	Hoole, Chester—Street Works	Urban District Council	A. E. Caidcutt, 17 Newgate Street, Chester.
" 3	Saffron Walden, Essex—Materials	Corporation	A. H. Forbes, Borough Surveyor, Saffron Walden.
" 5	London S.W.—Vans and Trucks	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, East Hill, Wandsworth.
" 5	London, N.—Road Works	Hornsey Urban District Council	E. J. Lovegrove, Engineer, Southwood Lane, Highbury, N.
" 5	Chingford—Road Works	Urban District Council	W. Stair, 14 The Parade, Chingford.
" 5	Loughton, Essex—Quenach and Guernsey Granite, &c.	Urban District Council	District Surveyor, Council Offices, Loughton, Essex.
" 5	London, N.—Making up carriageway	Islington Borough Council	J. P. Barber, Borough Engineer, Town Hall, Upper Street, N.
" 5	London, E.—General Paving Works	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 5	Hetton-le-Hole, Durham—Materials	Urban District Council	J. Harding, Surveyor, Council Offices, Hetton-le-hole, R.S.O.
" 6	Windsor—Making-up, &c.	Town Council	Borough Surveyor, Alma Road, Windsor.
" 6	Chipping Norton—Stone	Town Council	T. Mace, Town Clerk, Chipping Norton.
" 6	Milnrow, Lancs—Materials	District Council	W. H. Easter, Surveyor, Council Offices, Milnrow.
" 7	Leek, Staffs—Materials	Urban District Council	J. Myatt, Town Surveyor, Town Hall, Leek.
" 7	Leith, Scotland—Macadamising	Town Council	Borough Surveyor, Town Hall, Leith.
" 8	London, N.—Reconstructing Roadway	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 10	Church, Lancs—Materials	Urban District Council	W. E. Wood, Surveyor, Council Offices, Church.
" 10	Church, Lancs—Paving, &c.	Urban District Council	W. E. Wood, Surveyor, Council Offices, Church.
" 13	Llanwern, Wales—Improving Road	Magor Rural District Council	J. Thomas, Clerk, Union Offices, Queen's Hill, Newport.
SANITARY:			
May 1	Gateshead—Sewer	Corporation	J. Bower, Borough Engineer, Town Hall, Gateshead.
" 1	Tynemouth—Sanitary Pipes, &c.	Rural District Council	A. S. Dinning, 21 Ellison Place, Newcastle.
" 1	Belper—Sewers	Rural District Council	K. O. Cordon, Engineer, Hazelwood, near Derby.
" 1	Featherstone, Yorks—Sewerage Works	Urban District Council	F. B. Rothera, Engineer, District Council Offices, Featherstone.
" 1	Pilley, Tankersley, Yorks—sewerage Works	Wortley Rural District Council	G. E. Beaumont, Engineer, Grenoside, near Sheffield.
" 1	Southend-on-Sea—Sewers, &c.	Corporation	A. Fidler, Borough Surveyor, Southend.
" 1	Glasgow—Pipes, Manholes, Drainage Works, &c.	Corporation	Office of Public Works, City Chambers, 64 Cochrane St., Glasgow.
" 2	Yeovil—Sewerage Works	Rural District Council	J. M. Rodder, Clerk, 30 Kingston, Yeovil.
" 3	Doncaster—Sewerage Works	Rural District Council	D. Balfour & Son, 3 St. Nicholas Buildings, Newcastle-on-Tyne.
" 3	Bishop Auckland—Sewers, &c.	Rural District Council	O. Johnston, Surveyor, Crofton House, Bishop Auckland.
" 5	Newark—Sewerage Works	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
" 5	Milnrow, Lancs—Materials, &c.	District Council	W. H. Foster, Surveyor, Council Offices, Milnrow.
" 7	Linchester, Ashton-under-Lyne—Sewerage Works	Rural District Council	Hinnell & Murphy, 26 Corporation Street, Manchester.
" 7	Derby—Sewerage Works	Corporation	J. Mansergh & Sons, 5 Victoria Street, Westminster.
" 13	Richmond—Lime, Sulphate of Alumina, Filter Cloth	Main Sewerage Board	W. Fairley, Engineer, Kew Gardens.
" 14	Brightingsea, Essex—Sewageing	Urban District Council	W. J. Osborn, Clerk, Foresters' Hall, Sydney Street, Brightingsea.
" 14	Middlesbrough—Lime, Disinfectants, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
" 19	Penrith, Cumberland—sewerage Works	Rural District Council	J. Granam, Engineer, Bank Chambers, Bank Street, Carlisle.
TIMBER:			
May 6	Bradford—Timber	Cleansing Committee	E. Call, Hammerton Street Depot, Bradford.
" 7	Gravesend—Firewood	Guardians	H. J. King, Acting Clerk, Town Hall, Gravesend.
" 8	Hammersmith, W.—Re-laying Wood Floors	Fulham Parish Guardians	E. J. Mott, Clerk, Fulham Palace Road, Hammersmith, W.
June 9	London, W.C.—Firewood	London School Board	Contracts Sub-Depart., School Bd. Offices, Victoria Embankment, W.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 1	York—Queen Victoria Memorial	£50.	W. H. Andrew, Town Clerk, Guildhall, York.
" 1	Mexborough, near Rotherham—Accident Hospital	£35 £40.	C. Brampton, Fern Villa, Mexborough.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagenaw, Borough Engineer, Municipal Offices, Harrogate.
June 1	Knareborough—Infectious Disease Hospital	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 12	Crewe—Municipal Office and Council-Chamber	£50, £25.	Borough Surveyor, Municipal Offices, Crewe.
" 16	Hartshill, Stoke-on-Trent Nurses Home	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 27	West Hartlepool—School	£75, £35.	J. K. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolio of Drawings or designs in any style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50 £25.	Borough Engineer, Town Hall, Sunderland.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja uprava, St. Petersburg.
No date.	Dublin—Market for Sale of Old Clothes, &c.	—	F. Sutton & Son, 62 Dame Street, Dublin.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BARRY (WALES).—For the erection of a Forward Movement Hall at Barry. Mr. George Thomas, F.R.I.B.A., F.S.I., architect, Queen's Chambers, Cardiff:—
Lloyd & Tape ... £3,057 0 0
J. Allen & Sons, Cardiff ... 2,970 0 0
T. W. Davies ... 2,010 0 0
E. R. Evans Bros., Cardiff ... 2,800 19 1
A. Richards ... 2,575 0 0
W. Britton ... 2,501 0 0
E. B. Smith-Jones ... 2,750 0 0
J. Prout ... 2,725 0 0
H. S. Rendell* ... 2,682 2 0
* Accepted. [Rest of Barry.]

BRIGHTON.—For the enlargement of the Dutching Road School, for the Brighton and Preston School Board (U.D.). Messrs. Thomas Simpson and Son, surveyors, 16 and 17 Ship Street, Brighton:—

G. R. Lockyer, 16 King Street ... £2,050 0 0
General Builders, Ltd., Notting Hill, London ... 1,985 0 0
J. Barnes, 90 and 100 North Street ... 1,919 0 0
W. Taylor, 44 Midge Street ... 1,870 0 0
Sattin & Evershed, 27 Freshfield Road ... 1,800 0 0
Holloway Bros., A. Dyke Road Drive ... 1,791 4 9
* Accepted. [Rest of Brighton.]

BROMLEY.—For the erection of a golf clubhouse, Sundridge Park, Bromley, Kent. Messrs. Swan and Norman, architects, Clifford's Inn, E.C. Quantities by Messrs. C. Stanger & Son, 21 Finsbury Pavement, E.C.1:—

Building.
F. P. Duthoit ... £3 180 0
Arnand & Son ... 3 100 0
Grubb & Son ... 3 135 0
L. Evans ... 3 130 0
Crossley & Son ... 3 082 0
H. Lowe ... 3 065 17
H. Chapman ... 2 908 0
T. D. Grady ... 2 905 0
Larke & Sons ... 2 960 0
Perry Bros. ... 2 908 0
F. G. Minter* ... 2 935 10
* Accepted.

Drainage.
Larke & Sons ... 220 0
Perry Bros. ... 215 0
H. Lowe ... 215 0
F. G. Minter ... 213 0
Grubb & Son ... 192 0
H. Chapman ... 187 0
T. D. Grady ... 187 0
F. P. Duthoit ... 185 0
Arnand & Son ... 181 0
L. Evans ... 180 0
Crossley & Son ... 172 0

Fiche.
Larke & Son ... 70 0
T. D. Grady ... 70 0
F. P. Duthoit ... 62 0
Arnand & Son ... 60 0
Grubb & Son ... 60 0
H. Chapman ... 60 0
L. Evans ... 58 3
Crossley & Son ... 58 0
F. G. Minter* ... 57 10
Perry Bros. ... 54 0
* Accepted.

CARMARTHEN.—For the construction of new cattle markets and appurtenant works, for the Carmarthen Town Council. Mr. F. J. Pingle, borough surveyor:—
R. Davies, Carmarthen ... £3,970
E. Powell, Pontypriid ... 3,874
Davies & Griffiths, Pembroke Dock ... 2,777
* Accepted.

CLUTTON (SOMERSET).—For the erection of school buildings and teacher's residence for the Clutton School Board. Mr. W. F. Bird, architect, Midsomer Norton. Quantities by the architect:—
S. Dodimead, Shepton Mallet ... £5,790 0
T. Foster, Radstock ... 5,434 0
Orchard & Son, Banbury ... 5,177 0
Chancellor & Sons, Bath ... 4,980 0
Hayes & Son, Bristol ... 4,940 0
Win. Tovey, Midsomer Norton ... 4,819 10
John Flower, Harptree ... 4,071 0
Wills & Son, Bath ... 4,000 0
E. Walters, Bristol ... 3,830 0
* Provisionally accepted.

GOSPORT.—For the erection of new fire station, for the Urban District Council. Mr. H. Frost, surveyor:—
Lane Bros., Gosport ... £1,070
Lear & Son, Alverstoke ... £1,030
Dash, Gosport ... 1,059
J. Hunt, Gosport ... 1,095
Dugan, Portsmouth ... 1,060
* Accepted.

ILFORD.—For the erection of a junior mixed school for 500 children, with latrines, playsheds, caretaker's house, &c., on the Loxford Hall Estate, Ilford, for the Ilford School Board. Mr. C. J. Dawson, F.R.I.B.A., architect, 7 Bank Buildings, Ilford:—
Deering & Son ... £9,000
Davis & Leane, Southend-on-Sea ... 9,583
Kirk & Randall, Woolwich ... 9,416
W. Shepherd, Bournemouth ... 9,277
Holiday & Greenwood, Brighton ... 9,252
S. Parmenter, Braintree ... 9,034
J. Chessum & Sons, Bow ... 8,990
Hammond & Son, Romford ... 8,982
H. & E. Davey, Southend-on-Sea ... 8,945
H. J. Carter, Grays ... 8,852
Foster Bros., Norwood Junction ... 8,784
J. Barker & Co., Kensington ... 8,705
F. Willmott, Ilford ... 8,715
B. E. Nightingale ... 8,689
J. Appleby ... 8,554
* Accepted.

ILFRACOMBE.—For the erection of St. Peter's New Church. Mr. George H. Fellows Prynn, architect, 6 Queen Anne's Gate, Westminster, S.W.:—
W. Wiffen, Holsworthy ... £10,796 17 04
Stephens, Bastow & Co., Bristol ... 10,692 3 4
W. Dart, Crediton ... 10,352 0 0
Luscombe & Sons, Exeter ... 9,992 0 0
F. J. Reed, Ilfracombe ... 9,066 5 7
Willcocks & Co., Wolverhampton ... 9,583 0 0
P. Bowen, Ilfracombe ... 8,414 17 1
Britten & Pickett, Ilfracombe ... 7,531 8 8
* Accepted.

IRTHLINGBOROUGH.—For the erection of a concert hall for Band Club, Irlthlingborough. Messrs. Edward Sharman, Caleb Archer, and J. Melfort Sharman, architects, Wellington, Norfolk:—
Bayes ... £90 0 0
E. Brown & Son ... 890 0 0
F. Henson ... 895 0 0
T. C. Berrill ... 895 0 0
W. Stevens ... 886 0 0
Sparrow ... 875 0 0
Titmas ... 860 0 0
Hacksley Bros.* ... 855 5 5
* Accepted.

LONDON, S.E.—For the foundations of Bermondsey Police Station and Court. Mr. Dixon Butler, architect. Quantities by Messrs. Thurgood, Son, and Chidgey:—
Foster & Dicksee ... £5,990
Spencer, Santo & Co. ... £4,680
Higgs & Hill ... 5,350
J. Parker ... 4,590
Ashby & Horner ... 5,348
Martin, Wells & Co. ... 4,462
Lovatt ... 5,288
Kilby & Gafford ... 4,420
Lawrence & Sons ... 5,214
Holloway Bros. ... 4,395
H. J. Williams ... 4,987
Clarke & Traeger ... 3,939
Mowlem & Co. ... 4,507
Grover & Sons ... 3,874
Lascelles & Co. ... 4,750
* Accepted.

LONDON, S.E.—For additions to Glenwood, Westcote Park, S.E., for Mr. T. E. Scrutton, K.C. Mr. Alfred Roberts, architect, Greenwich, S.E.
Kennard Bros. ... £1,680
H. Groves ... £1,311
W. Mills ... 1,351
T. D. Leng* ... 1,250
* Accepted.

LOUGHBOROUGH (LEICS.).—For the erection and completion of a house, Herrick Road, Loughborough, for Mrs. S. Richards, Loughborough. Mr. Albert E. King, architect, Baxter Gate, Loughborough:—
W. F. Harding ... £1,140
C. Wheatley & Son ... 1,114
A. Faulks ... 1,065
J. Hutchinson & Son, Nottingham ... 1,060
E. Orton, Coalville, near Leicester ... 1,027
* Accepted.

NORBRECK (POULTON-LE-FYLDE).—For the erection of new house and private school. Messrs. Richard Gorst & Son, architects, 7 Birley Street, Blackpool:—
J. Parkinson & Sons ... £1,200 0
S. Butterworth & Sons, Ltd. ... 1,146 0
T. Lawson & Co. ... 1,135 12
R. Leach & Son, Cleveleys, Poulton-le-Fylde ... 1,135 0
* Accepted.

NEWCASTLE (STAFFS.).—For the erection of residence and stabling, Lancaster Road, Newcastle, for Mrs. Peake. Messrs. Mosley & Scrivener, architects, Fish Street, Northampton:—
J. Heath, Shoobridge Street, Leek ... £2,300 0
W. Cooke, Newcastle Street, Burslem ... 2,101 10
Meikeljohn & Son, Edward Street, Stoke ... 2,100 0
Tompkinson & Bettelley, Longton ... 2,067 0
Bennett Bros., Burslem ... 2,000 0
T. B. Voxall, Trent Bridge, Stoke ... 1,990 0
T. Godwin, Hanley ... 1,922 0
* Accepted provisionally.

RHOSLLANERCHRUGOG (WALES).—For the erection and completion of new schools and classrooms, and other works connected with same, for the Committee of Bethlehem Welsh Congregational Chapel, Rhosllanerchrugog:—
S. Moss, Coedpoeth, Wrexham ... £2,500 0
W. Jones, Chapel Street, Ponkey, Ruabon ... 2,370 5
J. Roberts, Johnson Street, Ponkey, Ruabon ... 2,350 0
T. L. Davies, School Street, Rhosllanerchrugog ... 2,347 0
* Accepted.

SLOUGH.—Accepted for the erection of a pair of villas, Wexham Road, Slough, for Mr. Charles Dix. Mr. W. J. Dunham, M.S.A., architect, 16 The Walk, Norwich:—
T. Perrin ... £1,150

ST. COLOMB MAJOR, CORNWALL.—For the restoration of St. Colomb Major Church, Cornwall. Mr. George H. Fellows Prynn, architect, 6 Queen Anne's Gate, Westminster, S.W.:—
Willcocks & Co., Wolverhampton ... £2,198 7 4
J. C. Lang, Liskeard ... 4,545 7 11
S. Frehan, Liskeard ... 4,480 13 4
W. Dart, Crediton ... 4,139 0 0
J. Collier, Truro ... 4,119 2 7
J. D. Hobbs & Sons, Liskeard ... 3,090 0 0
W. Wiffen, Holsworthy ... 3,615 1 3
* Accepted.

[NOTE.—The tower and new vestry work not to be executed at present.]

STREATHAM, S.W.—For addition of new vestries, heating chamber, &c., to St. Peter's Church, Streatham, S.W. Mr. George H. Fellows Prynn, F.R.I.B.A., architect, 6 Queen Anne's Gate, Westminster, S.W. Quantities by Mr. R. Henry Hale, F.S.I., of 33 Old Queen Street, Westminster, S.W.:—
W. Smith & Son, Kennington ... £2,394
Goddard & Sons, Dorking ... 2,200
J. & W. Bowyer, Norwood ... 2,103
W. H. Lorden & Sons, Upper Tooting ... 2,144
F. G. Minter, Westminster ... 2,127
C. Ansell, Lambeth ... 2,121
* Accepted.

SHIPLEY.—Accepted for the erection of a villa residence, Nab Wood, Shipley. Mr. Adn. Sharp, architect and surveyor, Albany Buildings, Marl Street, Bradford:—
Mason & Joiner—J. Deacon, Shipley.
Plumber—S. E. Jackson, St. Stephens Road, Bradford.
Plasterer—Andrew Taylor, Ecclehill.
Slater—Hill & Nelson, Edmund Street, Bradford.

TROWBRIDGE.—For the restoration of the Baptist Church, Church Street, Trowbridge. Mr. Walter W. Sniallm, P.A.S.I., architect, Church Street, Trowbridge:—
H. Ash, Devizes ... £2,573 0
Hayward & Wooster, Bath ... 1,995 0
G. Moore, Trowbridge ... 1,985 0
E. Linzey, Trowbridge ... 1,892 0
J. Long & Sons, Railway Road, Bath ... 1,838 0
A. J. Colborne, Swindon ... 1,463 1
* Accepted.

WALTHAMSTOW.—For the erection of new classrooms and cloakrooms and sundry alterations and additions to the Higham Hill and Forest Road Schools; also boundary wall at rear of Board's offices. Mr. H. Prosser, architect to the Board, School Board Offices, Walthamstow:—
Alterations and additions, Higham Hill Schools.
Viney & Stone ... £3,334 0 0
Pollard & Brand ... 3,315 0 0
P. E. Nightingale ... 3,180 0 0
Sands, Palmer, & Co. ... 2,985 0 0
Davies & Clayton* ... 2,579 10 0
* Accepted.

Alterations and additions, Forest Road Schools.
Viney & Stone ... £1,287 0 0
Pollard & Brand ... 1,150 0 0
P. E. Nightingale ... 1,100 0 0
Sands, Palmer, & Co. ... 1,052 9 3
R. & E. Evans* ... 895 0 0
* Accepted.

Boundary wall, Board's Offices.
Viney & Stone ... £70 0 0
Pollard & Brand ... 67 0 0
R. & E. Evans ... 65 0 0
P. E. Nightingale ... 57 0 0
Sands, Palmer, & Co. ... 51 7 0
Davies & Clayton* ... 47 10 0
* Accepted subject to the approval of the Board of Education.

House.	Stable.	Boundary Walls.
£2,300 0	£303 0	£200
2,101 10	290 5	91
2,100 0	285 0	80
2,067 0	280 0	97
2,000 0	279 0	89
1,990 0	270 0	113
1,922 0	250 0	103

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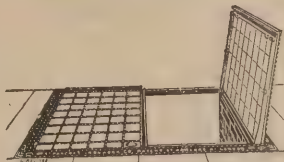
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COMING EVENTS.

Wednesday, April 30.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION (Students' Sketching Club).—Annual Meeting at 7.30 p.m.

INSTITUTION OF MINING AND METALLURGY.—Annual Dinner at Hotel Cecil at 7.30 p.m.

SOCIETY OF ARTS.—Mr. Edward T. Scammell on "The Timber Resources of the Australian Commonwealth," 8 p.m.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Mr. E. R. Calthrop, M.I.M.E., on "Narrow Gauge Light Railways of Heavy Traffic Capacity."

RUSKIN SOCIETY OF BIRMINGHAM.—Annual Meeting. Mr. H. Lowerison on "Ruskin's Educational Theories," 7.45 p.m.

Thursday, May 1.

ROYAL INSTITUTION.—Dr. A. Smith Woodward on "Recent Geological Discoveries"—I, 3 p.m. Annual Meeting at 5 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

CIVIL AND MECHANICAL ENGINEERS SOCIETY.—Mr. J. R. Bell, M.I.C.E., on "Unit Stresses in Railway Girders," 8 p.m.

Friday, May 2.

INSTITUTION OF JUNIOR ENGINEERS.—Mr. Lewis H. Rugg on "Some Factors in Colonial Railway Construction," 8 p.m.

ROYAL INSTITUTION.—Mr. A. E. Tutton on "Experimental Researches on the Constitution of Crystals," 9 p.m.

Saturday, May 3.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at Carpenters' Hall, E.C., at 6 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Torwood Castle and Broch of Tappock.

SANITARY INSPECTORS' ASSOCIATION.—Meeting at Carpenters' Hall, E.C., at 6 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION (Students' Sketching Club).—Excursion to Hexham.

Monday, May 5.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Annual General Meeting at 8 p.m. Report of the Council for the official year, 1901-1902. Election of the Royal Gold Medallist for the year. Sanction of new form of agreement and schedule of conditions for building contracts for use where quantities form part of the contract.

SOCIETY OF ENGINEERS.—Mr. Brierley D. Healey on "Recent Blast-Furnace Practice," at 7.30 p.m. ROYAL ACADEMY opens.

Tuesday, May 6.

SOCIETY OF ARTS (Applied Art Section).—Mr. Charles T. Jacobi on "The Printing and Illustration of the Modern Book," 8 p.m.

Wednesday, May 7.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Annual Meeting at 4.30 p.m.

SURVEYORS' INSTITUTION.—Annual Dinner.

SOCIETY OF ARTS.—Mr. Albert Chancellor on "The Origin and History of Carriages," 8 p.m.

IRON AND STEEL INSTITUTE.—Annual Meeting at the Institution of Civil Engineers at 10.30 a.m. Election of Officers and Council. Presentation of the Bessemer Gold Medal for 1902 to His Excellency F. A. Krupp, of Essex. Report by the Committee appointed to investigate the Nomenclature of Metallurgy.

Mr. Horace Allen on "A New Vacuum Teyere for Blast Furnaces." Prof. J. O. Arnold and A. McWilliam on "The Microstructure of Hardened Steel."—Annual Dinner at 7 p.m. at the Hotel Cecil.

Thursday, May 8.

IRON AND STEEL INSTITUTE.—Annual Meeting at the Institution of Civil Engineers at 10.30 a.m.

—Mr. J. H. Darby, Brymbo, on "The Compression of Fuel before Coking." Mr. James Douglas, L.L.D., on "Gas from Wood for use in the Manufacture of Steel."

Mr. P. Eyerman on "A Combined Blast-Furnace and Open-Hearth Process." Mr. W. J. Foster on "The Physical and Chemical properties of Carbon in the hearth of the Blast-Furnace." Baron H. von Jüptner, Donawitz, on "The Sulphur contents of Slags and other Metallurgical Products." Messrs. A. McWilliam and W. H. Hatfield on "The Elimination of Silicon in the Acid Open-Hearth Furnace." Report on Research Work carried out during the past year, by Mr. J. A. Mathews, Ph.D. Mr. H. Kilburn Scott on "The Iron Ore of Brazil." Mr. J. Thiry on "The Recovery of By-products in Coking." Mr. Axel Wahlberg, on "Briquet's researches on the influence of Chemical composition on the soundness of Steel Ingots."

ROYAL INSTITUTION.—Dr. A. Smith Woodward on "Recent Geological Discoveries," 3 p.m.

Friday, May 9.

ARCHITECTURAL ASSOCIATION.—Mr. Owen Fleming, A.R.I.B.A., on "Artizans' Dwellings from the Municipal Point of View." Mr. Louis Ambler, F.R.I.B.A., on "Artizans' Dwellings from the Private Point of View," 7.30 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

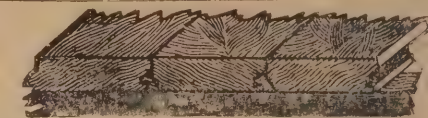
Saturday, May 10.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Haskinsing Works, Walker-on-Tyne.

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Queen
Victoria
Memorial.

As they have heard practically nothing since the exhibition of designs last November, people are beginning to ask what is

being done with regard to the National Memorial to Queen Victoria. The fund now amounts almost to £200,000; and though such a sum is utterly inadequate for the carrying-out of the entire scheme, it will probably suffice for the memorial itself, the laying-out of the roadways around Buckingham Palace, and, probably, the erection of the stone screen across the front and the semi-circular colonnade. Perhaps, by that time, there will be sufficient money forthcoming to rearrange the Mall and erect the monumental arches at its eastern end. However, we are in a position to state that Mr. Aston Webb and Mr. Brock have been instructed to proceed with their design, but, of course, it will not be possible to make any show on the ground for some time to come; especially in view of the Coronation and its functions.

Newspapers
Again.

WE have had occasion before to refer to the foolish and ignorant criticisms of architecture

which constantly appear in the daily press. Two more of a flagrant kind have recently come to our notice. A well-known western morning newspaper, after stating that until a few years ago public buildings, town-halls and municipal offices were chiefly remarkable for their ugliness (a discriminating statement, and generous withal!), notes with satisfaction the change for the better which has taken place. So much can be passed, but how deplorable that a newspaper, read by the people and, by force of habit, their source of ready-made opinion—how deplorable that it should print such twaddle as this: "Architects are now encouraged to submit drawings of handsome, as well as useful, buildings. A square box-like erection of bricks and mortar gives place to attractive, bright-looking structures. This is as it should be." A certain popular London daily is worse. Under the descriptive heading of "Connoisseurs' Comments" we read that "remarks on the exterior of the new Westminster Cathedral become more caustic every day as the scaffolding is removed." Also that one "authority" from Liverpool called it a "chimney stack and two gasometers"; another "expert": "A piece of Continental tawdry shoved into a handsome building"; and another, "A factory with a rubbish shoot." Referring to a recent visit of an architectural society to Bentley's great work, our esteemed contemporary observes that "the general impression was that the fancy work of

the façade was cheap and paltry. The exterior needed decorations on a grander and more massive scale than the carving on drawing-room furniture." The last remark is doubtless as brilliant for its wit as the rest of the criticism is for its intelligence. Yet, headed by this opinion and following like sheep, many of the public will be misled and a gross injustice done to a great architect. As we have already said, the pity is that the newspapers, which reach the very persons whose taste needs most to be improved, should be so densely ignorant as to print stuff like the foregoing. Naturally, the influence of the technical press is infinitesimal compared with that of the daily press: and if the newspapers would only publish intelligent and helpful criticisms of new buildings they could do more than anything else—and do it more quickly—to improve the standard of public taste in regard to architecture.

tender where the bills of quantities are not made part of the contract one of the chief grievances and sources of loss to the contractor may be stamped out. Building owners generally seem to consider that it is hard that they should be made responsible for any mistakes that occur and that they should not be able to reckon on an inclusive price as the cost of the job before it is begun, but the remedy is to employ thoroughly capable architects and quantity surveyors. After all, the building owner gets this extra work more than he bargained for and receives full value for his extra money. It should not be thought that as the quantities are aids to the builder he should pay for them and take the responsibility of their correctness, for the advantage to building owners is that they get more tenders in competition, with lower and closer prices, the contractors being able to omit any allowance for contingencies. As a general rule wild tender-



Quantities. WE are glad to see that the Institute has at last taken up the question of bills of quantities and has suggested clauses making the bill of quantities part of the contract, for adoption in its "general conditions." It is only right that this should be done in every case, for quantities are supplied to contractors as correct, otherwise they would be useless. In most cases there is no opportunity (or often not sufficient time allowed) for the quantities to be checked by the contractor, and unless quantities were supplied few or no competitive estimates would be received for large works. It is, therefore, most unfair that the contractor should be made to suffer for any mistakes there may be in the quantities. The Institute's action will call renewed attention to the subject, and if contractors will steadily refuse to

ing occurs where builders take out their own quantities. Where quantities are included in the contract the quantity surveyor will become responsible to the building owner, and when this is appreciated, more care will be taken to select a competent one.

New Premises at Hitchin.—The above drawing illustrates the first design for a small block of offices recently erected at Messrs. G. H. Innes & Co.'s Agricultural Implement and Iron Works at Hitchin. The materials were local red brick facings and hand-made roofing tiles, wood sashes and frames, with plaster cove, &c., to eaves. The contractors for the premises were Messrs. J. W. Willmot & Sons, of Hitchin & Hornsey. Mr. Geoffrey Lucas, A.R.I.B.A., was the architect.

ARCHITECTURE AT THE ROYAL ACADEMY.

THERE is no *chef-d'œuvre* to be seen in the architectural room at the Royal Academy exhibition this year; there is no great conception or monumental design: but the domestic work is excellent and thoroughly English in feeling: and when it is considered that such work makes up the greater part of the collection the fact is particularly gratifying. Architects, whether it is the result of copying or by reason of their improved taste, have adopted simple, straightforward treatments in designing those small houses for the outskirts of cities, or the country, and the result is eminently satisfactory. White rough-casted gables, good brickwork, plain painted woodwork, tiled roofs and the absence of elaborate ornament borrowed from mansions and palaces—these are the characteristics of the houses exhibited: and even in the largest of them there is the same simplicity and restraint. Simple, however, as some of these designs may appear at first sight, there is one great difficulty to be contended with—to avoid affectation. A building may err just as much in point of barrenness, or roughness, as in over-elaboration, and its ultimate success is exactly in proportion to the ability which has been displayed in avoiding the extreme. Some designers seem to have such a horror of an even surface—a kind of applied hatred of the machine—that all their timbers must be chopped and cut about till they look more like the work of a savage than a civilised being. Thus it is that some of the “newer” work, in its excessive desire for “truth,” becomes affected and false. There is, however, very little of the ultra-romantic school to be seen in this year's exhibition at the Academy. On the contrary, the general level is much more sane and much more satisfactory in effect. Many of the well-known men exhibit, but others, equally prominent, do not—for example, Mr. Champneys, Mr. Lethaby, Mr. Bateman, Mr. Lutyens, Mr. Lorimer, Mr. Buckland, Mr. Prior, Mr. Quennell, Mr. Ibberson are not represented. Mr. Ernest Newton shows one drawing only—the garden of a house at West Green, Winchfield; a red brick house very characteristic of this architect, with its brick-work patterns and its collected chimneys, though the gables are not round-topped. Mr. Arnold Mitchell is represented by “The Royal Villa” near Ostend, some schools at Southwold, and a house at Northwood, the last being a delightful composition with three bays on the garden front running up the two storeys, filled in between with modelled plasterwork, and crowned by a heavy distinctive cornice. Mr. Leonard Stokes shows some delightful work also, in the new wing to Ascot Priory (“T. F. G.,” who made the drawing, is certainly a very accomplished line draughtsman) and “Hill End,” Wendover. Mr. John Belcher's work at Guildown Grange, Guildford, at Tapeley Park, North Devon, and at Cornbury Park, Oxon.—large country mansions—is in his best manner, very refined and academic, but his city work at Electra House is not so pleasing, while the premises at 88, Fleet Street certainly do not add to his reputation. Messrs. Ernest George & Yeates exhibit two drawings of additions to Welbeck Abbey (where the disastrous fire occurred some time ago); they are also making additions to “Foxcombe,” Oxford, including a hall 70ft. by 25ft. The house at Wrotham, Kent, by Messrs. Niven & Wigglesworth is a delightful composition, with white rough-casted gables and tiled roofs, and the drawing itself, by Mr. Griggs, is excellent. Mr. Henry T. Hare exhibits a good drawing (again by “T. F. G.”) of a house at Oxford: Mr. Reginald Blomfield some drawings by himself of the very fine additions he is making to Brocklesby Park: Mr. Baillie Scott the exterior of a “House in Germany” and an interior of the dining-room decorated in his peculiar manner: Mr. R. A. Briggs the new piazza and porch of Cowley Manor, Gloucestershire (illustrated in our issue for October 30th, 1901) and a very pleasing red brick house at Welwyn, Herts: Mr. A. N. Prentice a scholarly design for the dining-room to a mansion in Suffolk, with rosewood panelling and moulded plasterwork on the ceiling ribs, and that excellent house at De Pary's Avenue, Bedford (illustrated in our issue for June 26th, 1901): Mr. Arthur J.

Penty a design for a country house, and another for the dining-room of a house at Scarborough: “Moonhill,” Cuckfield, Sussex, by Mr. P. Morley Horder and Mr. Thomas Mawson, as architect and garden-architect (illustrated in our centre plates this week): Messrs. Mallows & Grocock a house at Biddenham, Bedford: Mr. E. Guy Dawber the entrance and garden fronts of Westhope Manor, Shropshire (the work itself restrained and satisfactory, but the drawings very inferior): Mr. Lionel F. Crane a sketch for Mrs. Brown-Potter's boat-house (illustrated in our issue for September 4th, 1901): “Phillimore House,” Dean's Yard, Westminster, by Mr. George A. Hall (illustrated in our issue for March 19th last): Mr. Walter Cave some stables in brick at Henley (illustrated in our issue for July 10th, 1901): and Messrs. Walsh & Nicholas a club-house for the Halifax Golf Club (illustrated on the opposite page).

Of church work several good examples are shown. First there is Professor Beresford Pite's new church being erected at Brixton (the drawing of which does not do it justice, as it is really a remarkably good piece of constructive design) and a view of the new chancel to Clapham Church, another characteristic example of this architect's freshness in treatment. Mr. T. G. Jackson shows a poor design for an organ loft and screen in the church of St. Mary the Virgin, Oxford, and two of the stall ends in Giggleswick School Chapel (figure modelled by Mr. T. Carter), the latter being very clever and effective (see our issue for April 2nd last). Mr. Reginald Blomfield exhibits a drawing of the new organ gallery and case for the chapel at Haileybury

College: Mr. Bodley the new church of Holy Trinity at Kensington (an inferior specimen of work by this architect): views of the proposed rebuilding of Manningtree Church by Mr. Geoffrey Lucas: Mr. R. A. Briggs's very remarkable design for an iron mission church at Pentonville, all the interior fittings of which—pulpit, &c.—are of iron: Mr. Bodley's design for the monument to the late Duke of Westminster in Ecclestone Church, a fine work and a fine drawing (by Mr. Griggs): two churches by Mr. Fellowes Prynn: a new chancel screen at St. John Baptist, Potter's Bar, by Mr. Roland W. Paul, simple and neat: Mr. Eastwood's bold design for St. Ann's Cathedral, Leeds: two churches by Mr. Temple Moore in his best manner: the rood screen at Cranfield Church, Bedfordshire, by Messrs. Mallows & Grocock (illustrated in our issue for January 8th last): a new church at Longdon, Leek, by Mr. Gerald C. Horsley: Mr. W. H. Bidlake the west front of St. Agatha's Church, Birmingham: and St. John's Church, Byfleet, by Mr. Caröe, who also exhibits a drawing of a monument to the late J. L. Pearson in Westminster Abbey.

Coming now to work other than domestic and ecclesiastical, we find several designs of considerable excellence. There is the general scheme of the new buildings for Birmingham University by Messrs. Aston Webb and E. Ingress Bell, an immense work set out on a semi-circular plan, the drawing of which fails to render the feeling of size. Mr. H. Percy Adams exhibits a very brilliant drawing (by Mr. H. F. Waring) of the British Hospital at Constantinople,



(In this year's Academy.)

CLUB-HOUSE FOR HALIFAX GOLF CLUB. J. F. WALSH AND GRAHAM NICHOLAS, ARCHITECTS. (*In this year's Academy.*)

one of the most notable exhibits in the room, fresh in treatment and thoroughly suited to the brilliancy of the Turkish capital. Messrs. Ernest Runtz & Co. show a wash-drawing of the new Gaiety Theatre and Restaurant. The view is taken looking on to the corner, with the curve of the crescent to the left and the great block of the Restaurant piling up at the back. On the whole the effect is good, but the dome looks insufficient. Sir Thomas Drew exhibits his design for the Spring Gardens approach to the Queen Victoria Memorial (illustrated in our issue for November 6th, 1901) and a relic of the same subject is found in Mr. Inigo Thomas's suggested treatment of the Mall, drawn, without apparent reason, like an eighteenth-century engraving. Mr. Mountford is represented by a fine drawing in colour of the interior of the lower hall to the new Sessions House at Old Bailey, a very effective design. Mr. Paul Waterhouse has two small designs for Maurice Hostel, Hoxton, and a cypress walk. Messrs. Briggs & Wolstenholme exhibit the new head-offices they have designed for Elder, Dempster & Co. at Liverpool: Professor Aitchison sends a drawing of some city offices, which, however, do not call for any special remark: and Messrs. Bedford & Kitson show the Fountains Abbey Hotel, Ripon, an excellent design. A drawing is shown of Mr. John Dixon Butler's new police-station in Hyde Park, but the building itself is far finer in effect. Another noteworthy exhibit is Mr. Joseph H. Hirst's design for a new fruit market and corn exchange at Hull (illustrated in our last issue). Mr. Penty shows a good water-colour of the interior of the "Davy Hall" Restaurant at York (illustrated in our issue for December 4th, 1901), the colour scheme of which is particularly happy. In the middle of the room are two models, one of the dome of Electra House, Finsbury Pavement, and the other of the Bradford Queen Victoria Memorial, by Mr. Alfred Drury and Mr. J. W. Simpson.

As regards the sculpture at the Academy this year, there are many busts by well-known men, but nothing of any immediate architectural interest.

Richmond Hill View.—Mr. A. M. Torrence, chairman of the Executive Committee, writes: A month ago we needed £18,000 to complete the purchase. We have now received or have been promised the following:—Richmond Corporation, an additional £5,000; Twickenham Urban District Council, an additional £3,000; a gentleman who wishes his name concealed, £5,000; Mr. Pierpont Morgan, £1,000; Mrs. Evans, Nice, £200; and Mr. Herbert Cook, St. Paul's Churchyard, £50—or a total of £14,250. We still require £3,750. Sir Edward J. Poynter, president of the Royal Academy, has taken a keen and active interest in this matter, and will receive donations.

THE FRIEZE OF TRIGLYPHS AND METOPES ON GREEK BUILDINGS.

By FREDERICK S. SALISBURY, B.A.

IN the days of Homer's Achæans the lavish revenues, which in later democratic days were expended on public buildings, and especially on the temples of the gods, were devoted to the erection and adornment of the palaces of kings—the lords of Mycenæ, Tiryns and Sparta. The chief decoration of a public building is external. It is not made to live in, and its adornment is conceived rather with a view to making it an ornament to the city than for the satisfaction of the comparatively few who from time to time enter it. On the other hand, a palace exists mainly for the benefit of those who occupy it, and hence external ornament is little regarded, while interior decoration is everything.

Homer says that round the brazen walls of the palace of Alcinous ran a frieze of a substance which he calls *kuanos*. It is almost certain that this was simply glass coloured blue with an oxide of copper. And an interesting discovery made by Dr. Schliemann while excavating the remains of the Palace of Tiryns shows us probably what it was like. He found there a frieze of alabaster, carved in patterns encrusted with blue glass. The design is peculiar—vertical bands, corresponding to the triglyphs of a Doric frieze, divide it into a series of panels. On each dividing band, instead of the grooves of a triglyph, is a row of four rosettes. In each of the panels thus marked off are two fan-shaped designs, in outline like the half of an ellipse cut off by the minor axis. The straight sides of the patterns are set against the vertical bands above-mentioned, and their curves touch in the middle of the panel.

Here we probably find the prototype of the frieze of triglyphs and metopes; and two points are important—it is internal, because at this period all decoration of any extent is internal; and it is a panelled, not a continuous frieze, because the latter, an Ionian development, is as yet unknown in Greece.

The application of this principle of decoration to the Doric temple is not the result of a direct descent. It must have been suggested by the form of the central member of the Doric entablature, inviting a mode of decoration dear to the Peloponnesian sculptor, who would see in the metopes a suitable and convenient field ready-made for the exercise of his art. The Ionian architect filled in the spaces between the ends of his wooden beams, and afterwards of their stone representatives, so as to present a level continuous band. This satisfied his instincts, and suited the nature of his unbroken

frieze. The Peloponnesian artist, on the other hand, obeying the same instinct which led him to break up his frieze of blue glass, merely blocked the opening with a receding panel, and later sometimes, but *not often*, used the panels as a field for sculpture. The salient triglyph then compelled a high relief in the metope, and thus produced a frieze which, without large alteration, was incapable of any but an exterior application.

The present article deals only with the frieze of triglyphs and metopes where used as a field for sculpture. The undecorated form occurs more often than is the case with the central member in the entablature of the Ionic Order. And naturally so, because the Doric Order is of altogether plainer conception and can more readily dispense with decoration.

The oldest example of metope-sculpture which we possess does not belong to the Greek mainland, but it may be closely connected with the Peloponnesus by descent, inasmuch as Selinus in Sicily, where it was found, was a colony founded in the seventh century B.C. by the Dorian town of Megara Hyblæa, itself a colony from Megara on the Corinthian isthmus. Only ten of the metopes of the temple at Selinus, known as Temple C, are sculptured, and these are arranged on the eastern or principal front of the building. A similar partial decoration will again be found on the Theseum at Athens.

The intimate connection of this frieze with the architecture precludes it from invading, as does the continuous frieze, temples of another Order, or even of occupying a constructively different part of the Doric temple. But if its history is simpler in this respect, it contains another element of complication. The continuous frieze is unaffected by the arrangement of the columns, except in so far that the central group, as on the Parthenon, obeys the same instinct which calls for a central intercolumniation on the front. But the rule which divides the panel-frieze into double the number of metopes that there are columns, and places two over each intercolumniation, renders the metopes liable to variation in length even on the same temple. It has been possible on this account to assign the sculptured slabs of the Selinus metopes to their proper position on the front, for their length gradually diminishes as they approach the angles on either side.

But Peloponnesian taste did not at all favour exterior decoration on the Doric Order. The motherland is more conservative than its colonies. We should have expected that the temple of Zeus at Olympia—the noblest and most famous dwelling-place of the Father-God that the Hellenic world contained—we should have expected this temple to be adorned in the most lavish and splendid manner that money could accomplish or propriety allow. But as far as the exterior is concerned propriety

apparently did not allow.* The frieze of triglyphs and metopes is there, but the sculptor's chisel has not touched a single slab. Over the entrance to the pronaos and the opisthodomos, however, twelve sculptured metopes were placed, six on each front, representing the labours of Heracles. From the point of view of historical construction this position is as admissible as that on the external frieze, and we notice that the metopes, which are regularly associated with the intercolumniations, do not go round on to the side walls of the cella where there are no columns beneath. On the other hand it performs a purpose which in the Parthenon is regarded as little more than decorative, and fulfilled by a continuous frieze. The dimensions of the metopes are uniform, the refinement noticed in those of the Selinus temple being dropped.

It is in the hands of Athenian artists that the Doric Order attains its most glorious development. Here Ionian grace and Dorian simplicity meet, and the severity of the one is tempered by the elegance of the other. The ninety-two metopes of the external frieze of the Parthenon were all sculptured in high relief. And though in the execution of some of the groups there are many deficiencies and traces of archaism, we may justly regard the frieze on the whole as the highest example of its class.

After its full perfection in the fifth century at Athens, the use of the Doric Order, and with it the frieze of triglyphs and metopes, becomes less common. But the habit of panelling decorative sculpture is extended, together with Athenian traditions of art, to outlying parts of the Hellenic World. Notably is this so in the frieze of the Heroon of Trysa, in the south-west of Asia Minor. Here we can no longer speak of triglyphs and metopes, for the intimate connection with the Doric architecture is broken. There is, as it were, a reversion to the primitive type of the alabaster frieze at Tiryns. The relief is low and the position is internal. And if on the old Doric temple at Assos we have found a series of subjects appropriate to metope-sculpture treated in the manner of a continuous frieze, in the Heroon of Trysa we meet with continuous subjects divided up into several elongated panels. It is a fusion of two hitherto opposed styles in an outlying province of Hellenic art, where their traditional distinctions are obscured.

The frieze is in two bands, one immediately above the other, and in this respect reverts right back to the parallel bands of Assyrian bronze reliefs, out of which one of its elements (the continuous frieze) arose.

On the east of the south wall, among other subjects, is a dancing scene, where on a series of panels with slightly raised edges women are dancing in pairs, one pair on each panel. On the same wall, on the higher of the two bands, is represented the massacre of the suitors of Penelope by the returned Odysseus and his son Telemachus. The subject is interesting, because it illustrates the story of this event given in the 22nd Book of the Odyssey, a poem in which we find a literary counterpart to the continuous frieze, though it is less epic and more dramatic than the Iliad.

But the scene in the Heroon is broken up, and yet not in an artificial manner. The interruptions are introduced as part of the composition itself, in the form of an architectural *mise-en-scène*. There is a piece of the wall of the banquetting chamber framing the half-opened door towards which Ulysses hastens torch and sword in hand; and a little further along, where the scene is that of the banquet-hall itself, with the guests reclining on their couches, stands a column which supports the roof. Though apart from this the composition is almost continuous, the panels appear to this extent to be treated as separate subjects, that Ulysses seems to occur on both—in the one advancing towards the door, in the other emerging from it into the hall.

On the band below is represented the hunt of the Calydonian boar, and here, in default of architecture, landscape objects are introduced, and the trunk of a tree answers the same purpose

as the column in the scene above. On the western wall the architectural characters are still more marked. The Greeks are attacking or have already mounted the walls of Troy. Both the upper and lower bands are here occupied with the same subject. The top of the wall is crowded with defenders, while below are groups of assailants or fugitives, having the wall for a background, and separated from one another by the projecting masonry of the towers.

In this curious frieze there is an artistic confusion which is instructive in more ways than one. It illustrates the ease with which, just as the stories of mythology, the types of art also take local colour from their environment. The same plant, it has been observed, which on Cuban soil produces the Havana leaf no longer retains its peculiar quality and character when transported to another land and tended beneath another sky. And so it is with Art. The Ionian and the Dorian traditions have preserved unaltered among the races that gave them birth the fundamental features which distinguished them from the beginning. And even when they meet on Attic soil, conservative reverence for the ancient forms, and the chaste art that still seeks its ends through restrained and dignified simplicity, is content to use Ionic and Doric side by side, and does not mingle them. So when two mighty streams unite, their currents for a time flow side by side unmixed within a common bed. But it is not for long. The waters must shortly coalesce, and the broader river flow on and be called by another name. And thus in the Heroon of Trysa, when the fifth century is scarcely spent, the missionaries of Attic art unite on Lycian soil the tradition of two rival styles. The result is neither Doric nor Ionic: it belongs neither to the east nor to the west: it is the herald of a new style which will claim the allegiance of the whole Hellenic world, which will consider no object in nature and no manifestation of feeling beyond the scope of its activity, and will even encroach upon the proper domain of painting in its search after the picturesque.

MALMESBURY ABBEY RESTORATION.

AT a meeting held recently at the Chapter-house of Bristol Cathedral in aid of the restoration of the Abbey Church of Malmesbury, the Lord Bishop of Bristol, after describing the early history of the building, said that Leland in Henry VIII.'s time had to visit the places where there were famous libraries and report to Henry what the nature of the contents of the libraries were. In that official capacity he went to Malmesbury, which stood very high indeed among the libraries of the kingdom of that period. Leland said he saw an abbey church and building "a right magnificent thing," and it must have been very true, although in his time the most prominent part of it had fallen. He (the Lord Bishop) was always glad that the great ruin of the main part came before the dissolution of monasteries. There was a great Norman central tower, two arches of which still remained. At the top of the tower there was a great pyramid, or spire, so elevated that the two put together were 21ft. higher than Salisbury; and, instead of standing low down by a river, this building stood high up, on an eminence. Even the nave that remained was a striking object standing up against the sky. It was of nine great Norman bays; then there came transepts; then there was the central tower; then the presbytery, five bays—the chancel, as they would call it now; and then behind that the Lady Chapel. The total length was 332ft. Except the ruins the nave only remained. That was 148ft. by 68ft., and six bays towards the east were complete and three bays were roofless. The west front was magnificent. It was 90ft. wide. The whole of the north side of the west front was broken away—it was said to have fallen when the cannons were fired for the restoration of Charles II.—and they only had the south half of the west front. It was in rather a ragged condition, that spoiled its effect and beauty, but they could straighten it up (1) and make some improvements and alterations

there, and that was what they were now desiring to do. There was a porch which was certainly second to none in the kingdom. It and the porch of a sister church were by Aldhelm. The date of the building of the Norman church was from 1135 to 1160. The clearstory of the nave was done soon after 1300, and at that time a stone vaulting was put on the nave. This, of course, caused a lateral thrust which the walls had not been prepared for, and that was the reason why the very striking flying buttresses were thrown across the roof of the aisles with counterbalancing pinnacles over the aisle walls, causing grave anxiety to the custodians of the building. He was thankful to say those were down. Every one that needed taking down and rebuilding had been taken down and rebuilt. All the upper surfaces of those that were not so bad as that had been made good, and the broken counterbalancing pinnacles had been repaired, so that the whole thing now, he was thankful to say, was as trim and square and right as it could be. Another great work that they had done had been to shore up the west front of the present six bays, and that had been done in the very happiest manner, he thought, possible. Instead of building a great ugly buttress, they had simply restored the parts of the Norman piers, both on the ground floor so to speak, and on the triforium and the clearstory they had simply replaced the pillars that were missing, and so had caught the projecting half-arches at the three storeys where the liability was to fall, and had met and counteracted the pressure by making the arcade of three bays perfect and complete. It was an exceedingly happy device; it had cost less money than building any other efficient buttress would have cost, it was beautiful instead of being horribly unsightly, and if at any time it was desired to complete the church and have the three western bays rebuilt, not one sixpence of what they had spent on this work would be thrown away. If they build buttresses every farthing of the expense would have been thrown away because the buttresses would have had to be removed. He thought that was quite an ideal way of dealing with a building of this description, and he might say that all through, wherever they had replaced they had left the moulding entirely uncut, so that no one could ever say—if the thing stood 1,000 years—no one could ever be taken in to believe that the work they had done in the last two or three years formed part of the original Norman work. They could not deceive anybody. Even where they were proposing to continue the cresting of the battlements, though for the satisfaction of the eye the whole thing was run in a straight line, he had so arranged that the cusps should be quite different. The ordinary eye would not see the difference, but anyone who understood architecture would be able to say up to what precise point the old work went; the rest might look as old as they liked, but the cusping was different. Great care was taken to have no vandalism and no deception. They had spent on this work about £3,600, a very large sum if they knew the circumstances of Malmesbury. They now wanted £1,200.

The New Church of St. Columba, at Horton, Bradford, in St. Margaret's Road, which has been built by Lady Powell at a cost of about £10,000, has been opened. The architects are Messrs. T. H. & F. Healey. It consists of a nave, with north and south aisles and quasi-transepts, with chancel flanked by a chapel and the organ-chamber. The church is not correctly orientated owing to the difficulties of the site. Space is found for the parish rooms beneath the building owing to the drop in the ground. The nave is of six bays, with pillars alternately octagonal and circular. The clearstory is continuous throughout the nave and chancel, and is lighted by coupled lancets, and the roof is of unstained wood. The chancel is of three bays, and the tympanum of the main arches bears sculptured medallions of angels in high relief—the work of Mr. Hammond, of Messrs. Farmer & Brindley, London. The building will seat 700 persons. The organ is being built by Messrs. Harrison & Harrison, of Durham. The principal contractors for the building were:—Masons' work, Mr. William Farnish, and joiners', Messrs. J. Taylor & Sons. The stone is from the Ringby Collieries, Halifax.

* It should be mentioned that the excavation of the American School of Archaeology on the site of the Argive Heraeum brought to light a torso and a few other fragments of metope-sculpture which, from the height of the relief, must have occupied an external position.

THE COUNCIL'S TOWN HALL.

Proposal for the "Island" Site.

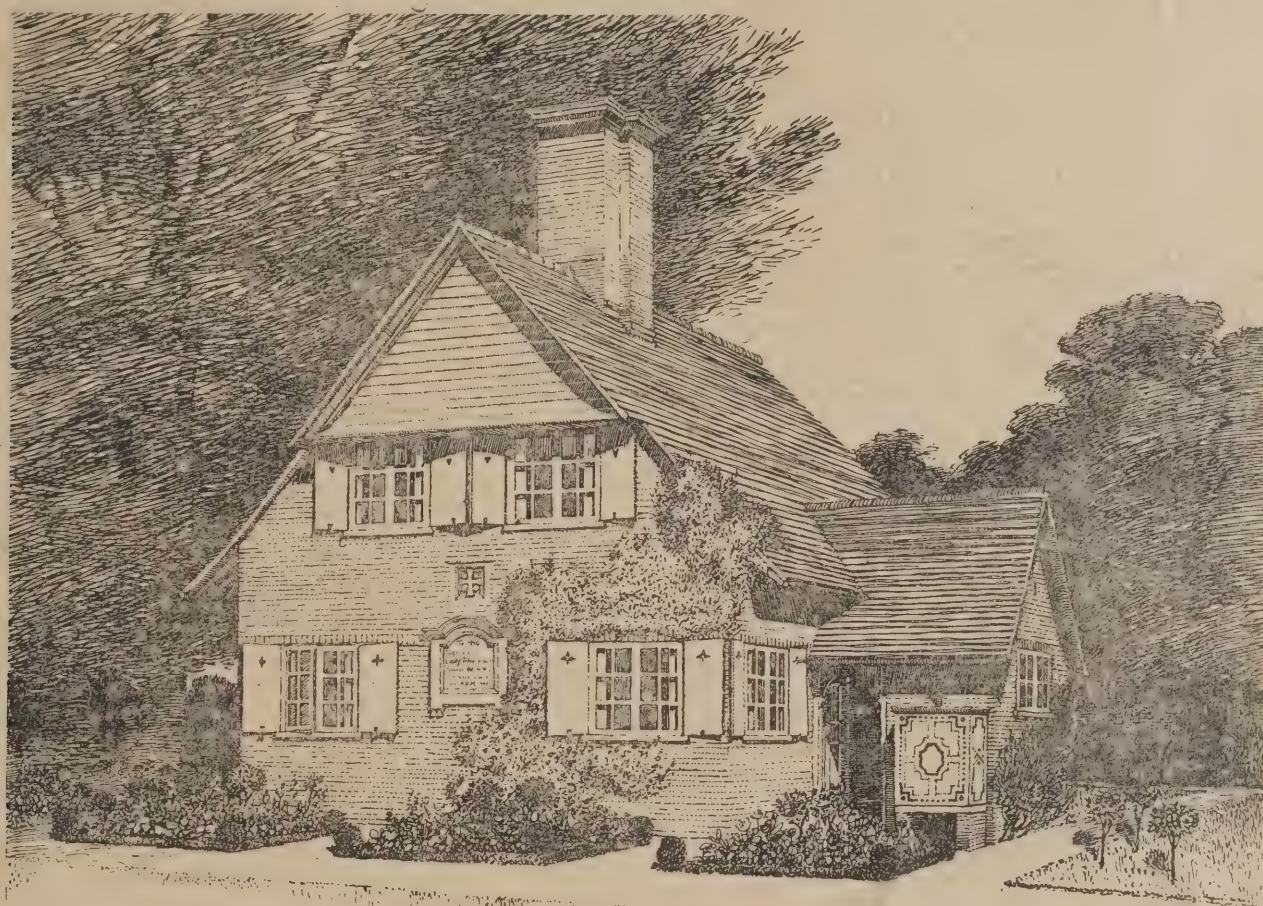
LAST week the special Sites Committee deliberated on the scheme for building a new home for the London County Council in the centre of the "island" marking the southern termination of the new Holborn-to-Strand thoroughfare. The present accommodation at Spring Gardens—a dingy set of offices inherited from the Metropolitan Board of Works, and enlarged at a cost of about £10,000—has long been inadequate. In 1890 the Council obtained authority from Parliament to borrow money for the purpose of buying the land for a proper building—a power afterwards renewed year by year. Later, a committee entrusted with the subject reported regarding several suggested sites. Christ's Hospital; 2½ acres on the Victoria

The latest is the "island" site, which, according to the "Daily News," is to be again recommended to the Council for acceptance. The cost of the site itself is put at £240,000 and the building at £750,000.

KINGSTON PUBLIC LIBRARY COMPETITION.

IT is intended to erect a new town hall at Kingston-on-Thames, in Fairfield West, at a cost of £6,000, and eight architects were invited to submit designs. Mr. Basil Champneys being appointed assessor. The designs were recently exhibited. No. 1 (by Mr. Alfred Cox, of London) was recommended for adoption: the plan, by reason of its compactness and utility of arrangement, is undoubtedly the best submitted. The staff enclosure commands a view of all the

position, but the tiled gable over the boys' porch is palpably weak. No. 5 is by Messrs. Hennell & Son, who have shown a long corridor in the centre of their library. There is an addition of a porter's lobby which commands a view of the boys' room. The front elevation is indifferent. Design No. 6 is by Mr. Sidney R. J. Smith, who has arranged his library apartments on two floors, which is a needless provision where the site affords an opportunity of securing accommodation without public staircases: but the design is perhaps the most pleasing sent in. No. 7 is by Mr. E. Milner Allen, whose plan is very good, but is marred by the complete separation of his reference room from his lending library. The elevations are noteworthy, but all the power is in the plans. Design No. 8 is by Messrs. Carter & Ashworth, of Kingston-on-Thames. It has the appearance of being a larger scheme than the



Nurse's Cottage, Heathfield, Sussex. Geoffrey Lucas Archt. London.

Embankment in the City; Barnard's Inn; 3 acres belonging to the Duke of Bedford near the British Museum; Millbank Prison; the Foundling Hospital; 107,000 sq. ft. in Fenchurch Street (for which £749,000 was asked); the Salisbury, or "Hotel Cecil," estate (offered for £400,000); 98,000 sq. ft. in Parliament Street; an area on the Victoria Embankment at Westminster; and Farringdon Market—all of these were, upon enquiry, found to be unsuitable for one reason or another. In 1896 the committee proposed that, in connection with the Government scheme for erecting new Admiralty buildings and forming an avenue from the Mall, the Council should enlarge its existing site to 2 acres, which would afford scope for the erection of a town hall worthy of London. It was estimated that the cost of acquiring the necessary property would be £610,000. The scheme was approved by the Council in July and a Bill was put forward in Parliament; in February, 1897, however, it was rejected by a majority of 82.

Since then several schemes have been considered, but not one has been finally approved.

public rooms. The exterior is a quiet, dignified example based upon the later work of Renaissance architects, but hardly assumes the character of a public library. Of the other seven designs, No. 2 is by Mr. A. J. Hardwick, of Kingston-on-Thames, who sends a plan of considerable merit, but the side porch contains both boys' and librarian's entrances, which is an objection. The elevations are ambitious and would largely depend on the colour treatment. Mr. S. B. Russell (No. 3) separates his boys by the staff corridor. The news room is rather ill-proportioned and would cause a greater amount of traffic than is desirable, and in the event of future extension (as proposed) this defect would be increased. The principal elevation is very refined; it is dependent upon four stone bays which are continued up to the eaves and from which two gables spring. Design No. 4 is by Mr. Maurice B. Adams, who contrives a space in his plan for consulting early morning advertisements in a portion of the hall, which would be shut off by a movable partition when put to this use. The design is of a typical old English brick and tile com-

others. The plan is very carefully thought out, but the elevations are made rather commonplace by unnecessary detail.

At a meeting held on April 29th the Kingston Town Council approved Mr. Basil Champneys' selection of design No. 1.

Nurse's Cottage, Heathfield.—This is a design for "Red Cross Cottage," intended to be built in Heathfield Park, Sussex, and used as a house for the parish nurse. The materials are brick facings and tiled roof, wood sashes and frames and weather boarding in the gables. On the first floor are three bedrooms and store spaces, with a rainwater cistern under the low roof. Mr. Geoffrey Lucas, A.R.I.B.A., is the architect.

New Sunday Schools at East Teignmouth are being erected on the site of the old Church House, adjacent to St. Michael's Parish Church. Messrs. J. W. Rowell & Sons, of Newton Abbot, are the architects, and Mr. E. Andrews, of Teignmouth, is the builder. The building is to be of red bricks with dressings of white bricks and Beer stone.

Engineering Notes.

The Chipping Hill School, Witham, Essex, is being warmed and ventilated by Messrs. E. H. Shorland & Brother's patent Manchester grates.

Mr. Amos Acaster, of the firm of A. J. Acaster & Co., engineers, Sheffield, was killed last week while superintending the packing of a boiler by the packing blowing out.

A New Electric Tramway System.—At Wolverhampton cars are running on an experimental portion of an electric tramway. Neither poles nor wires are used. All that is visible in the way of sources of electrical energy are box-lids let into the pavement between the rails, about 10ft. apart. Underground cables carry the electrical energy to the metal boxes inserted in the pavement of the track, and the current is conveyed to the apparatus under the car by means of a collecting shoe or skate, which passes over the stud or metal plate in the box-lid, gathering a continuous current just as the trolley-pole does from the overhead wire. The metal-box is made as simple as possible, and hermetically sealed to resist the entrance of surface water. Apparently the only objection that can be made to the contact boxes on the track is that the lids are raised slightly above the level of the paving blocks of wood or granite. The lids are, however, bevelled down at the

edges, and their surfaces are likewise corrugated to prevent any slipping on the part of horses. The Government Inspector has just passed the system. The cost of the system has reached a sum of about £30,000, irrespective of the power house, which already existed.

Electricity Generating Station for South Wales.—On Wednesday last, at Treforest, Pontypridd, Mon., Sir Frederick Bramwell laid the foundation-stone of the first generating station of the South Wales Electrical Power Distribution Co. Three others are to be erected immediately, at Neath, Cwmbran and Bridgend. The intention is to eventually create eight great stations for the production of electrical energy, so as to supply the whole of South Wales with power for its many works and its valuable collieries. At the buildings at Treforest 15,000 h.p. in engines, dynamos and boilers are now being provided for; but the station will contain, when completed, no less than 75,000 h.p., and no one unit will be smaller than 3,000 i.h.p. At present five combined sets of triple-expansion engines and generators, together with twenty-four water-tube boilers, and all the necessary auxiliary machinery, switchboards and mains are being provided for. The station will consist of a building 250ft. long, 146ft. wide and 55ft. high. The crank-shaft of each engine is to be coupled direct to a dynamo which will develop a three-phase current at a pressure of 12,000 volts. It will be supplied to consumers for any purpose and in any form, and at any

pressure required. In many cases the 12,000-volt three-phase current will be used without alteration of any kind for driving motors for various purposes. In other cases, where desired, it will be transformed down to a polyphase current of lower pressure, and in other cases it will be transformed to a continuous current; this last form will be used more particularly for lighting and tramway purposes. The first set of mains—those up the Rhondda Valley—will be laid during the coming summer. These mains will be laid about 2ft. below the surface in earthenware troughs filled in with hot bitumen and covered by earthenware tiles set fast in the molten compound. Instead of building costly chimneys the company will use forced draught in the boilers. Messrs. Bramwell & Harris are the consulting engineers to the company. Mr. E. L. Hill is the resident engineer.

An Energetic Lady Secretary.—Admiral Sir Henry Nicholson, K.C.B., chairman, and the directors of Electric Lighting Boards, Ltd., recently entertained a large party at luncheon at the Criterion Restaurant to meet Miss A. Ashton Bence on her departure for the Cape on the Electric Lighting Boards Company's behalf, the party including Sir James Weeks Szlumper, D.L., J.P., Prof. R. H. Smith, M.I.C.E., Mr. Edwin O. Sachs, A.M.I.C.E., Major Fox (London Salvage Corps), Dr. Hoffman (Home Office), Mr. Max Byng, M.I.C.E. (General Electric Co.), Mr. F. R. Farrow, F.R.I.B.A., Mr. Paterson (Johnson & Phillips), Mr. Bloxham (Abel & Imray), Mr. Crick (Rose-Innes, Son & Crick), Mr. Theodor (Theodor & Rawlins), and a number of friends and experts. Miss Bence made a similar visit to the United States in 1901, when the Company's properties in America were sold for a very large consideration.

Awards to Engineers.—The Council of the Institution of Civil Engineers have made the following awards for papers read and discussed before the Institution during the past session:—A Telford medal (in standard gold) to Mr. W. M. Mordey, and a George Stephenson medal (in standard gold) to Mr. B. M. Jenkin, M.I.C.E.; a Watt medal (in standard gold) to Mr. J. A. F. Aspinall, M.Inst.C.E.; and Telford premiums to Messrs. W. C. Copperthwaite, A. H. Haigh, B.Sc., and J. Davis, M.Inst.C.E. The Council have also awarded the Howard Quinquennial prize of the Institution to Mr. R. A. Hadfield, M.Inst.C.E. (of Sheffield) for his scientific work in investigating methods of treatment and new alloys of steel, and on account of the importance in industry of some of the new products introduced by him.

The Institution of Civil Engineers held its annual meeting last week, when the following officers were elected:—President, Mr. J. C. Hawkshaw; vice-presidents, Sir William White, Mr. F. W. Webb, Sir Guilford Molesworth and Sir Alexander Binnie; other members of the council, Mr. J. Barton (Dundalk), Mr. H. Bell, Mr. B. H. Blyth (Edinburgh), Mr. C. A. Brereton, Mr. J. Brown (Cape Town), Mr. R. E. Cooper, Colonel R. E. B. Crompton, Mr. C. W. Darley, Mr. G. F. Deacon, Mr. W. R. Galbraith, Mr. E. P. Hannaford (Montreal), Mr. G. H. Hill, Mr. J. C. Inglis, Mr. G. B. Jebb (Birmingham), Dr. A. B. W. Kennedy, Sir W. T. Lewis (Cardiff), Mr. J. A. McDonald (Derby), Mr. W. Matthews, Mr. W. Shelford, Mr. A. Siemens, Mr. H. C. Stanley (Brisbane), Mr. J. Strain (Glasgow), Mr. J. I. Thornycroft, Professor W. C. Unwin, Mr. F. R. Upcott, C.S.L., and Sir Leader Williams (Manchester).

Trow Hall, Salcombe Regis, Devon.—This house is in course of erection for Mr. and Mrs. Arthur Stone. The hall, which is in the centre of the house, is the principal feature. It is 30ft. by 26ft. on the ground floor and about 50ft. by 26ft. on the first floor. The gallery runs all round, and at the opposite end to the staircase provides a space for a billiard-table. The woodwork is, in oak, the floor being of oak blocks. All the principal rooms are approached from the hall and gallery. The exterior of the house is principally half-timber and rough-cast, the roof being tiled. Mr. R. W. Sampson is the architect, and Messrs. R. W. & J. Skinner, of Sidmouth, are the builders.



HALL AND STAIRCASE, TROW HALL, SALCOMBE REGIS, DEVON. R. W. SAMPSON, ARCHITECT.

Bricks and Mortar.

APHORISM FOR THE WEEK.

A man must be thirty years of age before he is fit to begin to make a fortune. He may have completed it at fifty, and he begins to build in his own age, and dies by the time his house is ready for the painters and glaziers.

LA BRUYÈRE.

Our Plates.

"PORTLEY WOOD," Surrey, has lately been built at Whyteleafe on high ground in Portley Wood, whence it takes its name, and occupies a beautiful site of about 3 acres surrounded by fine trees. The walls are of red bricks, the upper portion being hung with tiles. The roof is also tiled. The bargeboards and timbering in the gables are of oak left rough from the saw. The posts of the loggia are of old ship oak left rough, and it has a black and white marble floor. The house contains no drawing-room, in accordance with instructions, its place being taken by the loggia, which commands beautiful views of the neighbourhood and is practically an open air sitting room, being used for several of the daily meals in summer. There are nine bedrooms, two dressing-rooms and the usual offices. The cost, including the entrance lodge, was about £3,500. Mr. Walter E. Hewitt, A.R.I.B.A., of 22, Buckingham Street, Strand, was the architect, and the late Mr. D. Debenham, of Betchworth, the builder. A drawing of another view of this house was hung in last year's Royal Academy Exhibition.—"Littlegrange," Whyteleafe, Surrey, is erected in a charming position, and has cream rough-cast walls and red tile-hung gables with Broseley roof tiles. The porch is constructed of unwrought oak felled upon the property. The billiard-room wing has not yet been built, the drawing-room (which is 25ft. by 18ft.) being used as such at present and the library as the drawing-room. The house contains nine bedrooms, dressing-room, &c., and was built by Messrs. J. & J. Ward, builders, of Warrington, at a cost of about £3,000, inclusive of the entrance lodge now in course of erection. The architect is Mr. Walter E. Hewitt, A.R.I.B.A., of 22, Buckingham Street, Strand, W.C. Both the views here published are by Mr. Raffles Davison, who sketched the trees surrounding the houses on the spot.

Underground Railway Stations.

MR. WILLIAM WOODWARD writes: "Parliamentary Committees are now occupied in considering many underground railway schemes involving above-surface stations in prominent West-end positions. The stations already erected in connection with these railways, presumably from the designs of their engineers, are wretched terra-cotta structures, apparently cast from one badly-detailed mould. Is it too much to ask that Parliament should in some way secure—and secure it effectually—that these stations should be designed with more regard to architectural propriety, and with some consideration for their immediate surroundings, and further that the companies should be compelled to make presentable and architectural the unsightly flank walls—never intended to be exposed—which are left up after the scheduled houses have been pulled down? The scandalous proceedings of the Great Central Railway at St. John's Wood, which have resulted in permanently disfiguring what was one of the most beautiful parts of London, should be always before the minds of Parliamentary Committees."

Wendlebury Church.

AFTER having been closed for nearly twelve months, the parish church of St. Giles, Wendlebury, was reopened recently. The building has undergone, as far as funds would permit, a thorough restoration, and although a great deal still remains to be done to complete the work, it is so far finished as to allow the usual services to be conducted. The tower has been entirely taken down and the materials stacked in the churchyard for future use. The west wall of the nave has been rebuilt to form a side of the future tower, the arch being reconstructed as before. The south transept has been rebuilt from the foundations to form the side of the nave, whilst a new arch has been constructed to the north

transept. The window over the doorway has been removed and the opening built up. The whole of the parapet walls have been taken away to the level of the ceiling and new roofs put to the nave, chancel and transepts. The ceiling of the new roofs is of $\frac{3}{4}$ in. grooved and tongued pitch-pine boarding, with moulded fascia and ribs laid on. The outer plates and tilters are of oak, and the roofs are covered with red tiles, each secured with two galvanized pins. The plaster has been removed from the jambs of the chancel arch and the stonework dressed down. Monk's Park Bath stone has been used for the facings and all joints have been painted with Portland cement where necessary. The ground around the church has been excavated 6in. below the floor-level, and the buildings have all been properly drained, the new drains consisting of 50ft. of 4in. and 100ft. of 6in. glazed socketed pipes on 4in. of concrete. All outside ironwork has received three coats of paint. In the interior the seats have been removed and re-fixed in different positions, the staining having been made good and two coats of varnish applied. The repairs yet to be done to complete the specifications include paving the floors of nave and transept, repairs to front and fittings of chancel.

frescoes of famous artists. In the court of the art gallery copies of sculptures and statues are arranged. The Exhibition comprises in all 160 buildings, which extend in a wide semi-circle along the bank of the Rhine for nearly a mile and a half. The responsible architect is Herr Georg Thielen, of Hamburg. The largest structure, and that which gives its impress to the entire Exhibition, is the machinery hall, an enormous building over 900ft. in length, but without any architectural pretensions. The huge palace of the firm Friedrich Krupp, with its iron-clad towers and its frontage of over 400ft., dominates the eye at entering and opens the triumphal way of Rhenish-Westphalian industry.

Burlingwick.

EVERY available acre of land at Chiswick has now been snapped up by a body of influential capitalists, as we stated last week, for the purpose of erecting houses thereon. Dr. W. B. Gordon Hogg, the coroner for West Middlesex, has stated that the Chiswick District Council was much concerned as to whether these capitalists will inflict on the parish additional responsibilities in consequence of the provision, as is suggested, of mor



GATEHOUSE, LINDLEY, HUDDERSFIELD. EDGAR WOOD, ARCHITECT (see p. 182).

A small "ting-tang" has been fixed to the west gable to take the place of the bells which at present are in the churchyard. The whole of the work has been executed by Messrs. Grimsley & Son, Bicester, under the supervision of Mr. J. Oldrid Scott, F.S.A., Oxford.

Düsseldorf Exhibition.

THE Cork and Wolverhampton International Exhibitions and the Düsseldorf Industrial and Art Exhibition were all opened on May 1st. That at Düsseldorf is the largest held in Germany, and among the branches dealt with are—metal industry; foundry; stone, clay, china, &c.; wood and furniture; building and engineering; sanitary and social institutions; and arts and crafts. In addition there is the affiliated exhibition of German national art and historical art, which is housed in a permanent art gallery 396ft. long, on the Rhine, and with a dome 138ft. high. At an expenditure of 100,000 marks faithful copies of the most important monuments, works of sculpture and architecture, church doors and monuments from the Rhine Province and Westphalia, as well as various interesting examples of profane art, are exhibited. There are also reproductions of the

than 7,000 dwellings for over-crowded London. In addition to this, a wider community is apprehensive lest the last remaining frontage of the River of Pleasure shall be banked by coal, cement and brick wharves or other plain structures. The capitalists who have acquired this property have, on the advice of Mr. Jonathan T. Carr, who is the manager and developer of their scheme, resolved that, if the district council will assist them to combine the ideal and the practical, so far as is possible, the local authority shall not be the losers. They have offered to the Council the whole of the two miles of river-frontage (unrestricted freehold) with a width of 80ft. for the nominal sum of 1s., on condition they agree to make and maintain it as a boulevard. The utility of river-frontage as a promenade and for boating and other purposes is apparent. Further than this, the syndicate are willing to devote 12 acres of land at an unusually low price for the purpose of erecting dwellings for the working classes, a want which is being much pressed on them by influential ratepayers and others. The remainder of the houses would range in rent from £50 to £75 per annum, the whole providing accommodation for about 40,000 persons. It is further suggested that much of the expense of maintaining the

river-frontage might be met by leasing the right to run tramways from the new Kew Bridge through Strand-on-the-Green to Chiswick Mall, whereby an alternative route would be provided to the present line running along the main thoroughfare. The scheme also provides for the erection of shops, but limiting these to one of each trade only, thus affording an opportunity for a good livelihood, and it is mooted that no credit will be allowed to be given at these shops. Mr. J. T. Carr built the successful suburb of Bedford Park, where land, twenty years ago worth £300 an acre, now sells at £2,000, and he has also been connected with the houses in Kensington Court. The local authorities require time for consideration, and wish to know whether the Middlesex and London County Councils are prepared to assist in so large an undertaking, as this is of more than local importance.

Housing in Rotherhithe. The London County Council have accepted Messrs. Holloway's tender of £8,122 for the erection of a portion of Winchelsea Buildings, Swan Lane site, for the accommodation of persons to be displaced by the construction of the Rotherhithe and Ratcliff tunnel. Winchelsea Buildings would provide accommodation for 200 persons. The plans of two further blocks of buildings, to be erected on the Swan Lane site (Rye and Sandwich Buildings), had now been prepared and had received the approval of the Secretary of State. These buildings would provide accommodation for a further 400 persons in forty tenements of two rooms and forty tenements of three rooms, and the plans were exactly similar to those of Winchelsea Buildings. Messrs. Holloway were prepared to build Rye and Sandwich Buildings for a sum of £8,021 for each block, or £16,042 in all, or including the comb-graining of the internal woodwork £16,184. This was a reduction on the tender for Winchelsea Buildings of £30 for each block of buildings. The architect's estimate of the total cost of the buildings amounted to £16,750, including £460 for architect's expenses, supervision, quantity surveyor's and other fees and incidentals.

Garden Design. Mr. F. W. MEYER, landscape gardener to Messrs. Veitch & Sons, of Exeter, recently lectured on "Garden Design" before the Devon and Exeter Architectural Society. Mr. Meyer regretted that architects and landscape gardeners did not always work in harmony. Sometimes it happened that the architect was not content with designing the mansion and superintending the erection, but also took upon himself to lay out the whole of the grounds. In ninety-nine cases out of a hundred such procedure must prove disastrous unless the architect were also a specialist in horticulture. Designing a garden did not depend merely on the rules of symmetry or hard-and-fast rules of design. Though in a large garden adjoining a mansion the immediate surroundings should be, if possible, in harmony with the style and character of the building, the principal and most pleasing effects of every garden could not be obtained by stones, bricks and mortar, or any other dead material, but must in all cases depend on the living and ever-changing materials of grass, shrubs, trees and flowers, which should blend harmoniously even with the landscape. Without an intimate knowledge of trees, shrubs and plants, no architect could design a good garden. His garden might look all right immediately after completion, but what would it be like eight or ten years hence, when the trees and shrubs had assumed larger proportions? The designer needed to look many years ahead. To lay down hard-and-fast rules, whether a garden should be in the geometrical regular style or in the natural style, was impossible. Broadly speaking, he favoured a pleasing combination of both, and, above all, thorough harmony of their surroundings. Not contraction within narrow limits, but expansion, must be the aim, and if by skilful treatment they could introduce an artificial perspective a comparatively small garden might not only be made to appear much larger than it really was but might be actually amalgamated with the landscape beyond—a result which, in most cases, would be found most satisfactory.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Cleaning Brickwork.

HAMPSHIRE.—A. Z. writes: "How can I improve the appearance of the red-brick front of a house now being finished off? The bricks are badly smeared with lime and cement mortar. The part that has been fresh pointed with a glaring white mortar looks even worse. Can the bricks be cleaned without spoiling their original face? Could they be washed over with any mixture that would darken the joints and hide the stains and at the same time not look too much like paint?"

Wash the bricks over with a strong solution of alum and red-oxide of iron.

The Slide-rule.

ANERLEY.—F. H. writes: "Kindly recommend a slide rule suitable for quantity work, or any good book on the subject of the slide-rule."

See "Quick and Easy Methods of Calculating. A simple explanation of the Theory and Use of the Slide rule, Logarithms, &c," by R. Gordon Blaine (E. & F. N. Spon, Ltd., price 2s. 6d.).

Measuring Buildings for Plotting.

WIGHT STUDENT writes: "Which is the best method of measuring buildings for plotting down in detail, say to $\frac{1}{16}$ in. scale or larger?"

A large sketch-book or block is used and a sketch plan made upon it, approximately to scale, upon which all dimensions are figured. Many surveyors do these sketches in a very rough manner, but the more nearly they are to scale and the more neatly they are drawn the better. The lines, for instance, ought to be ruled; and if the sketch-book itself consist of paper ruled in $\frac{1}{16}$ in. squares this greatly facilitates operations. Covering dimensions, say along the whole length of a wall, should be taken as well as the detail dimensions of window and door openings and of the spaces between them; other detail dimensions should at once in every case be totalled and compared with the covering dimensions. It is also of extreme importance that as many diagonal dimensions, from corner to corner of rooms, should be taken as circumstances will permit, angles which appear to be right-angles frequently proving when tested by diagonals to be acute or obtuse. Usually short dimensions are taken with the 2ft. rule or 5ft. rod, and longer ones, especially diagonals, with the tape—in which connection it is important that the tape used should be tested occasionally for correctness. The difficulty of correctly measuring old and irregular buildings is often considerable, especially if the sections be irregular and the plans of the floors materially disagree; but these difficulties can generally be surmounted by the exercise of patience and common-sense. On one occasion only have I found it necessary or expedient to employ a theodolite, but upon that one occasion it was invaluable.

G. A. T. M.

Rights of Adjoining Owners.

NOTTINGHAM.—H. A. B. writes: "X Y is the division line of two properties. A has right of eaves drop over B's property, and has recently pulled down his building and rebuilt with the projection of a 24 in. plinth on B's land, saying he has the right under his eaves drop. He has also put air-grates, which were not there before, above the plinth level. (1) Has A any right to project plinth or anything except his eave? (2) To put in air-grates? (3) Cannot B make A remove plinth so that at any future time B could build up to his boundary, so long as he provides means of escape for A's rainwater? (4) Has A any right over B's land at all beyond the right to project his eaves?"

(1) A has no right whatever to build a projecting plinth on B's land. (2) A has a right to

insert air-gratings, but B has an equal right to block them up, and must exercise this right for a consecutive twelve-month within twenty years of their insertion in order to prevent acquirement of a right of access of air to the gratings. (3) Yes; possibly A might pay a rental rather than remove plinth, if an action were brought, but negotiations should be carried on through a solicitor. (4) None whatever. G. A. T. M.

Casements: Draught-Excluders.

LONDON, N.W.—MULLION writes: "(1) Where can I get details of casements to open both ways for cleaning, similar to fanlights hung at the top? (2) Kindly recommend a trustworthy draught- and wet-excluder."

(1) See an article on "Weather-tight Windows" on p. 105 of our issue for April 2nd last. Casements opening both ways are generally specialties of manufacturers and details are given in their catalogues. "Specification No. 5" gives details of ordinary casements, &c. (2) Mr. Robert Adams, of 65 and 67, Newington Causeway, London, S.E., makes several kinds of weather-excluders which can be recommended.

Ancient Lights.

MACCLESFIELD.—J. C. writes: "I have pulled down some old buildings which have had ancient lights. It is now intended to erect a large room, or assembly hall, with roof as shown on the accompanying sketch (not reproduced). How far can I modify the size and shape of the windows so as to get one central and uniform, and if possible lower? The windows look into a yard belonging to a neighbour."

The best thing to do would be to open up negotiations with the neighbouring owner. In all probability he would be quite willing to allow a large central window to be opened up in exchange for the abandonment of all rights of light to windows 2 and 3. This he cannot be compelled to do, however. The new lights, if they are to retain the rights enjoyed by the old ones, must occupy the same positions. Any agreement should be drawn up by a solicitor.

G. A. T. M.

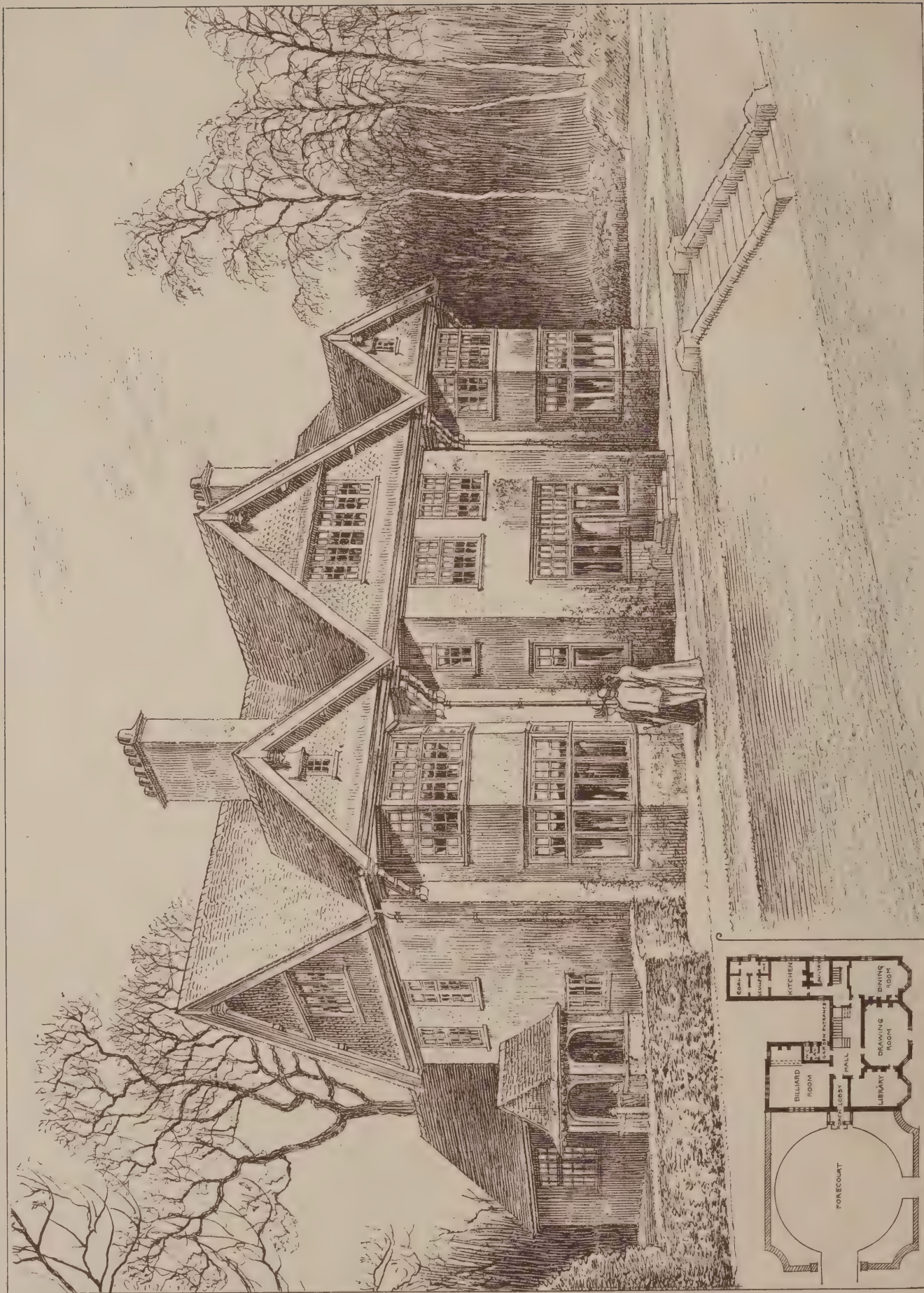
Architects' Accounts, Drawings, &c.

OBJECTOR writes: "(1) 'A builder neglects to furnish an architect with particulars for getting out a final statement of his account, although the builder's late manager has been repeatedly urged to do so; nor has the trustee under the bankruptcy asked the architect for a final statement. Is it necessary that the architect should bother to get out an account, or trouble further in the matter? (2) Is an architect and surveyor bound to give up his original or draft and office copy of drawings or other documents if demanded by employer, before the latter settles the former's account—the builder not having returned copies furnished him? (3) Where an architect has undertaken to get out drawings and specifications and do the general superintendence of the work, is it right for the employer to expect his architect, in addition, to measure off and get out builder's accounts without extra pay?"

(1) The architect should render an account upon the amount due to the builder, which he should know near enough for the purpose. We do not see that the architect need trouble to press the builder's manager for a full account, but when he asks for the final certificate refuse it until he renders the particulars. (2) The drawings are the sole property of the architect, and he can do as he pleases with them. If the employer wishes to check the account he has the building to check it by. The builder's copies are also the property of the architect. (See a reply on this subject on p. 214 of our issue for November 6th, 1901.) (3) The architect is entitled to extra payment for measuring and making out extras and omissions. A scale of fees is given in "Specification No. 5."

The Gatehouse at Lindley, Huddersfield, illustrated on the preceding page, is built of local stone of broken colour with stone slates on the roof.

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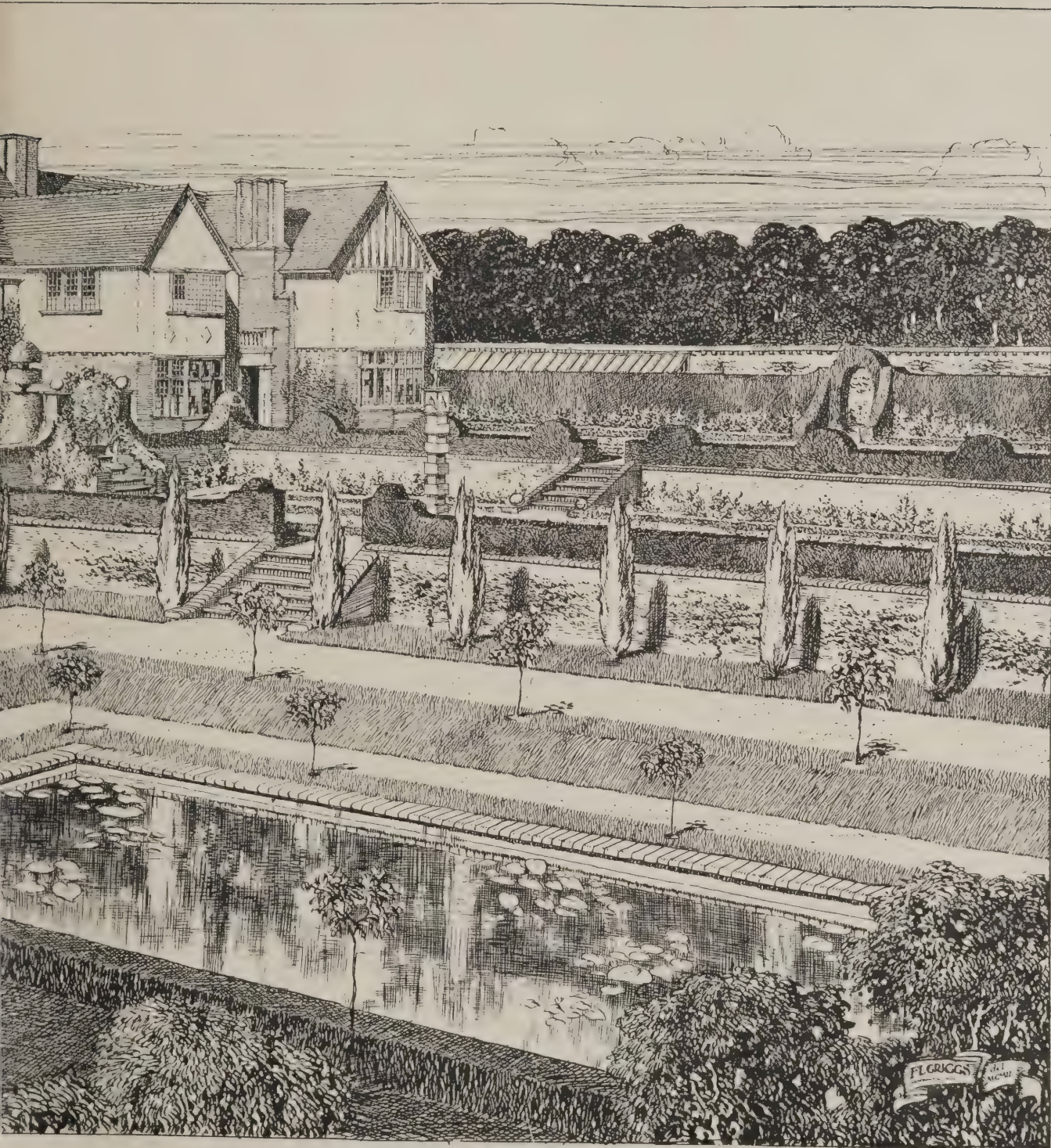
"PHOTO-LITHO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

"LITTLEGRANGE," WHYTELEAFE, SURREY. WALTER E. HEWITT, Architect.

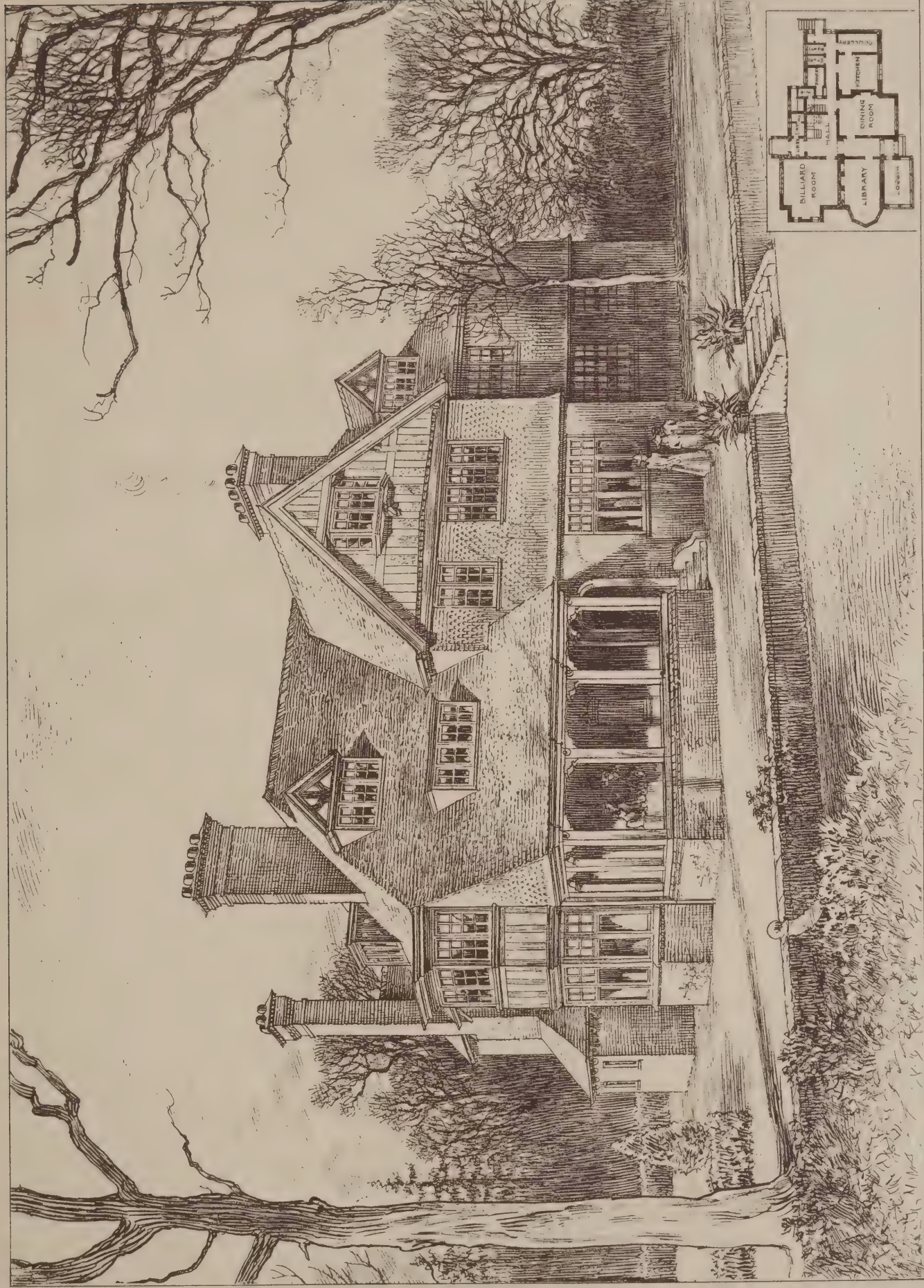
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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, May 7th, 1902.





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"PORTLEY WOOD," SURREY. WALTER E. HEWITT, Architect.

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Keystones.

The Weight of Timber used in Coronation Stands is estimated at 18,437 tons.

Mr. Aston Webb, A.R.A., has been nominated by the Council for the presidency of the R.I.B.A. during the next session.

Montrose Free Library.—The Town Council have recently selected a site in the High Street, at present occupied by the Union Inn, for the erection of a free library.

A New Volunteer Drill Hall at Newport, Mon., has been erected for the 4th V.B. South Wales Borderers. The material used is local stone, with freestone dressings.

Baths for Manchester.—The city architect of Manchester has been instructed to prepare plans for baths and a public hall for Bradford, on the site already purchased for that purpose in Victoria Street.

A Memorial to Queen Victoria, subscribed for by county justices of the peace and members of past and present county councils of Surrey, is to be erected in the county hall, Kingston-on-Thames, and will take the form of a statue of the late Queen sitting in the Coronation chair.

An Old Leicester Building pulled down.—The Tower House, in High Street, one of Leicester's most ancient and interesting buildings, has been razed to the ground for the purpose of street improvement. The Tower House was part of the Leicester residence of the third Earl of Huntingdon, and here were entertained and lodged James I., Charles I. and Charles II.

Clapham Parish Church is being extended and restored from plans by Professor Beresford Pite, F.R.I.B.A. The church was built some 130 years ago. The work is estimated to cost £7,400. The builders are Messrs. Garrett & Sons. Mr. Pite has designed a chancel, in harmony with the style of the church, of which he exhibits a perspective in this year's Academy. The work will be completely finished by Easter.

The York Architectural Society held its annual general meeting recently, when the following were elected to office for the ensuing year:—President, Mr. C. H. Channon, F.R.I.B.A. (Malton); vice-presidents, Messrs. A. B. Burrell and T. Monkman; members of council, Messrs. S. Needham, E. A. Pollard, A. G. Toomer, J. W. Biscomb and H. C. Cannell; hon. treasurer, Mr. T. Monkman; hon. secretary, Mr. Frank Raney; hon. librarian, Mr. S. G. Highmoor.

A.A. Summer Visits.—The Summer Visits Sub-Committee of the Architectural Association has proposed the following visits for the ensuing session:—May 24th: Christ's Hospital, Horeham (Mr. Aston Webb, A.R.A., and Mr. E. Ingress Bell, architects). June 14th: Shiplake Court, Henley (Mr. Ernest George, architect). July 12th: Some specimens of the work of Mr. C. F. A. Voysey, or the Chequers Court, Wexham. July 26th: Church and Monastery of St. Francis at Bocking Bridge, Essex (the late Mr. J. F. Bentley, architect), or Great Missenden Abbey. August 16th: Foots Cray Place, Foots Cray, or Great Tangley Manor and the Seminary at Womersley (Mr. F. A. Walters, architect). August 30th: Brooklands, Weybridge (Mr. Reginald Blomfield, M.A., architect); Esher House, Claremont, or Groombridge and Leeds Castle.

A New United Methodist Free Church at West-cliff-on-Sea has been opened in Leigh Road. It is in late Perpendicular Gothic style, freely treated, and is faced with red bricks externally, the dressings and tracery being of white Costessey stone. The roof is covered with green slates. The main gable is flanked on the one side by a dwarf octagonal turret, and on the other by a square tower, the latter terminating in a spirelet of quaint design. The church is designed for future deep double transepts, but these are at present only to be erected to a depth of a few feet. A large school and classrooms are provided for in the future. The present portion has been erected by Messrs. Bartley, Sons & Holness, 21, Old Kent Road, S.E. The cost is about £2,127. The architect, whose designs were accepted in competition, are Messrs. George Baines, F.R.I.B.A., & R. Palmer Baines, 5, Clement's Inn, Strand, London, W.C.

A New Church for Bournemouth is being erected at Heatherlands, to cost about £5,000.

A New American Government Building is to be erected at Washington at a cost of £1,400,000 for the accommodation of the United States executive and the departments of State and Justice.

New Public Baths at Heckmondwike have been erected in High Street. The baths are a section of a suite of buildings which also embrace an electric-lighting plant and fire station. Mr. J. Saville, surveyor to the District Council, was the architect.

"The Encyclopædia Britannica."—New volumes of this work are being issued to supplement the ninth edition. In Vol. I., A., Mr. H. Heathcote Statham, F.R.I.B.A., contributes a supplementary article on architecture, dealing with modern work; it is well illustrated.

New Buildings of the North Wales University College are proposed to be erected on a site given by the Bangor City Council. The site includes what are known as the Penrallt and Bishop's Park. Mr. Robson, architect to the Board of Education, has prepared plans to show the possibilities of the site.

A New Mission Church for Birmingham is being erected in connection with St. Oswald's Church, Small Heath. At the foundation-stone laying Lord Leigh used the mallet which was employed by Sir Christopher Wren in laying the foundation stone of St. Paul's Cathedral in 1675. The new church will be erected in the English style of architecture of the fourteenth century at a cost of £8,000.

"One and All Gardening" for 1902, edited by Mr. Edward Owen Greening, gives illustrations of Dove Cottage, Grasmere (the residence of Wordsworth and De Quincey); of Mr. G. F. Watts, R.A., sitting beside a sundial in his Surrey garden; and of Lady Algernon Gordon-Lennox's "Ideal Garden" at Broughton Castle. It is published by the Agricultural and Horticultural Association, Ltd., 92, Long Acre, W.C., price 2d.

A.A. New Premises: An Influential Appeal.—An appeal for funds towards building new premises for the Architectural Association (£20,000 required) recently appeared in the "Times." The following were the signatories:—W. H. Seth-Smith, R. S. Balfour, H. P. G. Maule, R. Rowland Anderson, John Belcher, Reginald Blomfield, G. F. Bodley, Thomas Brock, W. D. Caröe, Basil Champneys, Walter Crane, Sir Thomas Drew, William Emerson, Ernest George, T. G. Jackson, E. W. Mountford, Sir Edward J. Poynter, G. H. Fellowes Prynne, Sir W. B. Richmond, Leonard Stokes, Sir L. Alma-Tadema, Aston Webb.

Welbeck Abbey.—For nine months 250 men have been regularly employed in rebuilding the Oxford wing of Welbeck Abbey, which was destroyed by fire in October, 1900, but it will take another year and a half before the work is completed. During most of that time the abbey will be closed to the public. The Oxford wing was erected in 1743, and contained the famous Gothic dining-hall and the Swan drawing-room. The damage done by the fire was estimated at £50,000. The whole abbey is undergoing alteration and reconstruction. The famous tan gallop has been demolished, but the subterranean rooms and galleries constructed by the late Duke of Portland are preserved.

Mr. Thomas Oliver, F.R.I.B.A., architect, of Newcastle-on-Tyne, died recently in his seventy-eighth year. Deceased was senior partner of Messrs. Oliver, Leeson & Wood, of Bank Chambers, Moseley Street, Newcastle, and was elected a Fellow of the Royal Institute of British Architects in 1866. He entered into partnership with Mr. Leeson in 1879. The following are some of the works executed by his firm:—St. Barnabas Church, Dulwich; the Training College, Norwich; High School for Girls at Jesmond; new Technical College, Durham; Board School at Bishopswearmouth; Tramway Car Depot, &c., at Walker-on-Tyne; Cottage Homes for Pauper Children at Ponteland; Board Schools in Low Fell district, Gateshead. Mr. Oliver was the first secretary of the Northern Architectural Association, founded in 1858, and he retained the office until 1870, when he was elected president. In 1877 he was again elected to this position.

A New Cottage Hospital for Cupar, Fife, is proposed to be erected.

A Volunteer Drill Hall at Harleston has been erected from designs by Mr. A. Pells, of Beccles. Mr. A. F. Rayner was the contractor.

New Municipal Buildings at Hereford are being erected by Messrs. W. Bowers & Co., builders, of Hereford, whose tender amounts to £18,680.

Change of Address.—Mr. E. Harding Payne, A.R.I.B.A., architect and surveyor, has removed his offices from No. 28 to No. 11, John Street, Bedford Row, W.C.

Glasgow Cathedral.—The first step has been taken in the furnishing of the nave of Glasgow Cathedral. A new memorial pulpit, elaborately carved in oak, and designed by Mr. P. Macgregor Chalmers, architect, of Glasgow, has just been placed in position.

A New Wesleyan Chapel at Bradley is being erected at an estimated cost of £4,600. The building is in Gothic style and will accommodate 620 persons. The architect is Mr. C. W. D. Joynson, of Wednesbury, and the builder Mr. W. T. Lees, of Darlaston.

The Council of the Royal Institute of Public Health have conferred the Harben gold medal for the year 1902 on Professor William R. Smith, M.D., F.R.S. Ed., of King's College, late medical officer of the School Board for London, in recognition of his eminent services to the public health.

A New Reredos at St. Thomas' Church, Heigam, has been erected at the eastern end of the sanctuary, and stretches from wall to wall. Its height is 11 ft. It is designed in the fifteenth-century style of Gothic, and is entirely of Caen stone. It has been carried out in its entirety in the studios of Messrs. Harry Hems & Sons, of Exeter.

A New Board School at Worthing is being erected in Sussex Road, at a cost of about £5,000, from designs by Mr. R. Singer Hyde. A dado of glazed brickwork runs round the walls of the various apartments, and patent blackboards have been built in the walls of the classrooms, while the Bath stone corbels under the principals have all been suitably carved with a view to their being utilized as object-lessons for the children. Messrs. F. Sandell & Son are the builders, and Mr. S. Streeter is the clerk of works.

Excavations in Greece.—Mr. R. Carr Bosanquet, director of the British School at Athens, has begun excavations on a promising Mycenaean site at Palaioakastro, near Sitia, in Eastern Crete. Although it was not possible to devote any part of the Cretan Exploration Fund to this object, the sum raised being insufficient even for the completion of Mr. Evans's excavations at Knossos, the two explorers are working in concert, and the house at Candia which was acquired by the managers of the fund (of whom Mr. Bosanquet is one) is also at the service of the school.

At the Royal Academy Banquet, held last Saturday, the Prince of Wales, referring to art and architecture in the Colonies, said: "The splendid Parliamentary buildings of Ottawa and Victoria, British Columbia, are indeed worthy examples of architectural design; and, as a rule, the public buildings in the great cities which we visited can be most favourably compared with those of any of the large cities of Europe." The president (Sir Edward Poynter), in the course of his last speech, spoke of the Richmond Hill View and mentioned that they were still short of £4,000 towards the purchase-money of the estate.

The Aberdeen Public Library is proposed to be extended, the library committee of Aberdeen having had before them recently the subject of the proposed New Central Reading-Room, and two branch libraries, towards which Mr. Carnegie has given £6,000. The Buildings Sub-Committee recommended the adoption of the plan showing a two-storey building for the Central Reading-Room, which is to be an extension of the existing building. The estimated cost, apart from furnishings, &c., was put at £5,300. The branch reading-room at Torrie, of which plans were also submitted, was estimated to cost £1,500. The matter was referred to the Finance Committee to report.

Views & Reviews.

Sanitary Engineering.

To Messrs. Charles Griffin & Co.'s excellent series of books on engineering subjects has recently been added this book, dealing with a subject which has not previously received adequate treatment in a text-book. Sanitary engineering has now reached the position of being a specialized science, and a book was needed which covered the bare principles, dealing in a scientific manner with the subject as Professor Rankine has dealt with civil engineering. This we think Mr. Francis Wood has supplied. He has treated the subject from its very elements, constructing recognized formulæ *ab initio*, and in a way which only requires the most elementary knowledge of mathematics. The book begins with a chapter on hydraulics, &c.; then proceeds to formulæ for velocity of water in pipes, &c.; earth-pressure and retaining walls; power; house and land drainage; sewers and sewage pumping; drainage areas; trade refuse and river pollution; sewage-disposal; bacteriology; construction, materials and cleansing of sewers; sludge- and refuse-disposal; chimneys and foundations. In the introduction we notice the author refers to the importance of chemistry and geology in sanitary engineering work, and we should therefore have thought that he would have dealt somewhat completely with them, as this could be done in a short space. The defect should be remedied in future editions. In course of time the book will no doubt undergo considerable addition and alteration and will become somewhat more complete than at present, but we must not judge a new departure too closely. On the whole it must rank as the standard text-book on the subject.

"Sanitary Engineering: A Practical Manual of Town Drainage and Sewage and Refuse Disposal," by Francis Wood, A.M.I.C.E., F.G.S. London: Charles Griffin & Co., Ltd., Exeter Street, Strand, W.C. Price 8s. 6d. nett.

WESTMINSTER DECORATIONS.

Why an Italian Firm was Selected.

THE EARL OF ONSLOW, Lord Windsor and Col. Clifford Probyn explain why an Italian firm (Messrs. Fantappie) was selected from among those who put forward tenders for decorating the city of Westminster on the occasion of the coronation of his Majesty the King. In the first instance eleven firms were asked to submit designs and to tender. While considering their tenders, the Committee had placed before them a scheme of decoration drawn up by Mr. Frederick Viger, whose designs were shown to Sir Lawrence Alma-Tadema, R.A., and so highly approved of by him that the Committee determined to offer Mr. Viger the position of artistic adviser for the whole of the decorations. Mr. Viger's designs have also been submitted to the Royal Institute of British Architects, and have received their approbation. The Committee subsequently invited tenders from all these firms for carrying out Mr. Viger's scheme, but of these two only were in accordance with the specifications—that of Messrs. Pain & Son, whose estimate was £10,200, and that of Messrs. Fantappie, whose estimate was £5,990. Furthermore, the estimate of the latter firm included illumination, which none of the other tenders did. That item alone would cost between £1,000 and £1,200. The Committee feel that by illuminating the decorations at night additional pleasure will be given to many thousands who will not have an opportunity of seeing them by daylight. It will be noticed that the estimate of Messrs. Fantappie was the lower by £4,210. The Committee were influenced in their choice of this firm by the excellent work they have already done in Florence, Stuttgart, and, in 1897, in Piccadilly on the occasion of her late Majesty's Diamond Jubilee.

With reference to the foregoing Mr. Wolf Defries says: "An invitation was sent to firms of professional decoration contractors and others to submit alternative schemes for the decoration of a processional route at the rates of £250 and £500 per mile respectively. The schemes furnished in response to this invitation were submitted to artistic opinion by the authority

concerned, together with the designs which were ultimately given to an Italian firm for execution at the rate of considerably more than £2,000 per mile. As the result of this comparison the gentleman who submitted these designs, of which the execution is to cost from five to ten times the amounts to which the competing designers were requested to limit themselves, was appointed 'artistic adviser' to the authority, and his designs were adopted." Messrs. James Pain & Sons state that their tender *did* include the illuminations of the route and that the lighting to be done by the Italian firm will be by fairy lamps and candles. "Such lighting can be done at less than one-twelfth the cost of electric lighting."

Surveying and Sanitary Notes.

A New Refuse-destroyer at Taunton is being erected, and the Corporation has adopted the Horsfall system. A four-cell plant is being built capable of converting forty tons a day into innocuous clinker, a material much required for sewerage filtration in connection with the septic tank system of disposal, which the same authority has adopted on a large scale. The works will cost about £6,000, exclusive of site, but will, it is estimated, save £200 per annum by obviating the use of coal for the production of steam for the sewerage pumps.

Sanitation at Buckingham Palace.—The drainage and other sanitary arrangements which were carried out at Buckingham Palace by the officials of his Majesty's Office of Works a few years ago have been thoroughly inspected and tested by Professor Corfield, M.D., the Consulting Sanitary Adviser to his Majesty's Office of Works, who has reported "that the drainage arrangements have been very well planned and carried out, and reflect credit on all concerned with them." He has, however, suggested a number of improvements in the sanitary arrangements generally, the most important of which have been already carried out under his supervision and to his satisfaction. The remainder, which consist chiefly of certain rearrangements, will be carried out in the autumn.

Heaton Park.—The Manchester Corporation has applied to the Local Government Board for leave to borrow £231,050 for the purchase of Heaton Park and all that appertains to it. If acquired it will be used as a park and for no other purpose. This park was the seat of the Earls of Wilton since the creation of the title in 1801. The hall was originally built by Sir Thomas Egerton. It was commenced in the year 1772, and finished about 1780. The house was built after designs prepared by the celebrated architect Wyatt. The stables, which were near the house, were erected by Sir Thomas Egerton in 1777. The wall, which extended all round the park, is four miles long, 18in. thick at the bottom and 14in. thick at the top, and 10ft. high. There are seven lodges, which were also built from designs prepared by Wyatt.

Nottingham Improvements.—Much attention is being given by Nottingham people to the opening up of the Sneinton district and the important improvements consequent thereon. Mr. Arthur Brown, M.Inst.C.E., in accordance with instructions from the Improvement Committee of the Nottingham Corporation, has prepared a new report on the subject of the street improvements required for opening up the district mentioned. Suggested improvements in the locality have been the subject of discussion and reports for thirty years, but the time seems now to have come when the matter will really receive adequate attention. Mr. Brown says the requirements of the district appear to divide themselves into three portions. First, that there should be a route from the junction of Lower Parliament Street and Glasshouse Street to the junction of Carlton Road and Bath Street. Second, a route from the last-mentioned point—that is, the south end of Carlton Road—to a point on London Road opposite Leen Side. Third, a route as direct as possible from the junction of Lower Parliament Street and Glasshouse Street to the junction of London Road and Leen Side. The present tramway system

leaves practically untouched a very large district in the east, north-east and south-east part of the city, which is thickly populated.

New Patents.

These patents are open to opposition until June 9th.

1901.—Bath Taps.—6,382. J. BULEY, Suffolk House, Laurence Pountney Hill, London. By a special arrangement of the valves in a casing, hot or cold water, either combined to any extent or separate, can be obtained through one outlet nozzle and by the manipulation of a single lever.

Discharge of Water or Sewage from Reservoirs, &c.—6,754. R. TIPPETS, 72, Beaufort Road, Edgbaston, Birmingham. A pipe is provided having a flexible watertight joint at its lower end (at the bottom of the reservoir wall) and a float at the other end. Thus the discharge is kept uniform whatever the level of the water or sewage may be.

Surveyors' Levels.—10,447. W. F. STANLEY & H. T. TALLACK, both of 4 & 5, Great Turnstile, Holborn, London. To increase the strength of the instrument, and make it less liable to get out of adjustment, the body of the telescope and the centre are cast in one piece. The rack, in stead of being inserted in the side of the telescope draw-tube, is fixed below it and the pinion is thus given a double bearing in the cast body, greatly increasing its strength.

The following specifications were published on Thursday last, and are open to opposition until June 16th. A summary of the more important of them will be given next week. The name in italics is that of the communicator of the invention.

1901.—6,277. BAIRD, windows. 7,455, HAMILTON, machines for sawing cold metal and stone. 7,551, GUNN & GUNN, sewer cleaner or scraper. 7,829, DAVID, scaffolding. 7,872, FIELDING, artificial stone-slab machines. 7,939, CASSELS, latrines and water-closets. 8,202, WOODS, drain-gully dish and grid. 8,212, ROTTENBURG & PATERSON, COOPER & CO., LTD., covers for hand-holes. 8,428, JOHNSON (*Currie*), spring hinges for doors. 8,958, CAMPBELL, kitchen ranges. 9,624, PICKUP & BRADLEY, baths. 9,691, STALKER, compositions for preserving wood. 9,717, LAYCOCK, ventilators. 9,843, THOMPSON, thin partition walls. 9,845, BAIRD, apparatus for cleaning windows, walls and painted surfaces. 10,281, TRIER, apparatus for turning stone. 11,506, HAMMOND, cleansing eyes for intercepting traps and gulleys. 12,460, FETTE, screw taps. 14,006, SCHANZER, door-closers. 24,168, LEWIS, centrifugal fans for domestic purposes. 24,801, HOHAGEN, door locks. 26,677, HOW & KING, bolts for emergency exit doors.

1902.—1,336, GOBON, locks. 2,288, COULTER, locks and latches. 2,742, TAYLOR & MACLEOD, fibrous plaster slabs. 2,843, CLAUSON-KAAS, plastic compositions for woodwork, walls, &c. 3,820, KENNY, window strips and guides. 5,007, ROBINSON & HIGGINS, grinding mills. 5,807, WAKEFORD & SMITH, safety filling cock for tanks, &c.

Masters and Men.

The Stourbridge Building Labourers have struck in consequence of their demand for an advance of wages, levelling them up to 5d. per hour—an advance of a penny in the case of most of the men—being refused. The bricklayers and carpenters in the district have also been asking for an advance, but the masters have come to an agreement with them. The questions raised for the most part have been a matter of the arrangement of working rules.

The Sheffield Building Trades' Federation last week considered a report on the condition of the mill-sawyers and wood machinists of Sheffield, who at the present time are locked out at three of the timber yards situated in the city. It was decided to give to them the best financial assistance possible, and that the mill-sawyers, whilst engaged in so very dangerous an occupation, were morally entitled to receive from their employers what is honourably acknowledged to be but a reasonable living wage.

Builders' Notes.

Mr. Edward Punnett, head of the firm of Messrs. Edward Punnett & Sons, builders and contractors, of Tonbridge, died recently.

An American Contractor's Energy.—Mr. James Stewart, of Messrs. Stewart & Company, of Pittsburg, who built the Westinghouse works near Manchester, has secured contracts for building the new Midland Hotel at Manchester and for enlarging the Mersey Tunnel.

A Scaffolding Accident.—The scaffolding upon which two steeplejacks were working on a chimney at Cheetham and Hill's Foundry, Derby, collapsed. Both men fell 50ft. One was killed outright, while the other broke his fall on the roof of a shed, through which he crashed on to some barrels, sustaining concussion and broken ribs.

London County Council.—At last week's meeting of the Council the Fire Brigade Committee recommended "That the estimate of £10,163 submitted by the Finance Committee in respect of the enlargement of the Mile End Fire-Station be approved; that the Council do sanction an expenditure of £9,000 for the work of enlarging the station; that the work be executed by the Council without the intervention of a contractor; and that the drawings, quantities, specification and estimate be referred to the Works Committee for that purpose." Mr. Goodrich moved to refer the matter back with a view that the work should be advertised for tenders by contractors. Mr. Fletcher seconded the amendment, as he believed a contractor would do the work equally well and probably cheaper. Mr. Torrance, chairman of the Works Committee, said that the work hitherto done for the Fire-Brigade Committee by the Works Department had always been eminently satisfactory. Mr. Cousins pointed out that in several cases the estimates had been exceeded by over £1,000, while in only two cases had the cost been below the estimate. The amendment was eventually defeated, and the recommendation agreed to.—Mr. Alliston asked the chairman of the Public Control Committee whether steps could not be taken in connection with the blocks of buildings being erected by the Council to do away with fire-grates and heat the blocks from one furnace, which would burn smokeless coal. Mr. Squires said the Council had no jurisdiction of that sort. He suggested that Mr. Alliston should approach the Housing Committee on the subject.

R. I. B. A.

QUANTITIES IN CONTRACTS.

A SPECIAL general meeting of the Royal Institute of British Architects was held last Monday evening to elect Mr. Thomas Edward Colcutt, F.R.I.B.A., the Royal Gold Medallist for the current year. At the conclusion of this special meeting the annual general meeting was held, when the report of the Council for 1901-2 (of which we gave a summary on p. 167 of our issue for last week) was adopted. Scrutineers were then elected for the annual election of the Council and Standing Committees. Candidates were next nominated as auditors; and the Statutory Board of Examiners under the London Building Act, 1894, and other Acts of Parliament, were appointed for the ensuing year of office. Mr. James Glen Sivewright Gibson, of London, and Mr. Henry William Chatters, of Cheltenham, were then elected Fellows, and Mr. Alfred Arthur Hudson, of Wendover, Bucks, an Hon. Associate.

The issue was then sanctioned of a Form of Agreement and Schedule of Conditions for Building Contracts for use where quantities form part of the contract, the document being based on the form now in use with such variations as are necessary to meet the requirements of the proposed new form. The following are the clauses of the existing form which have been modified by the Practice Standing Committee to adapt them to the new purpose, the alterations and additions being printed in italics:—

1. The works shall be carried out in accordance with the directions and to the reasonable satisfaction of the architect, in accordance with the said drawings and specification and bills of quantities, and in accordance with such further drawings, details and instructions in explanation of the same as may from time to time be given by the architect. . . . The contract drawings and specification and the priced bills of quantities shall remain in the custody of the architect, and shall be produced by him at his office as and when required by the employer or by the contractor.

3. The contractor shall on the signing hereof furnish the architect with the *fully priced bills of quantities* for his use or that of the surveyor appointed as in clause 13 hereof, and for the purposes only of this contract.

Clause 13. The penultimate sentence to read:—The variations shall be valued at the rates contained in the priced bill of quantities, or, where the same may not apply, at rates proportionate to the prices therein contained.

27. The words "prime cost" or the initials P.C. applied in the specification and bills of quantities to goods to be obtained and fixed by the contractor, shall mean, unless otherwise stated in the specification or bills of quantities, the sum paid to the merchant after deducting all trade discount for such goods in the ordinary course of delivery, but not deducting discount for cash, and such sum shall be exclusive of special carriage, the cost of fixing and contractor's profit.

28. The commencement of the clause to read:—The provisional sums mentioned in the specification and bills of quantities for materials to be supplied or for work to be performed by special artists or tradesmen, &c.

CHARLES GARNIER.

A MEMORIAL to Charles Garnier, the famous French architect, is to be erected in front of Grand Opera House, Paris, and the red granite work for it has just been completed by Messrs. Alexander Macdonald & Co., Ltd., of Aberdeen. The main features of the design, which is in the French Renaissance style, are two immense spirals, or volutes, at either side of the memorial. These are cut from single blocks of stone. The cornice, which is segmental in plan, is elaborately moulded, a broad frieze being formed for the reception of M. Garnier's name, together with the dates of his birth and death. The superstructure has a scrolled pediment with an elaborate base for the reception of a bust of the great architect. Flanking the bust, and resting on the top of the spirals, will be symbolical figures. Bronze festoons of fruit, flowers and foliage will be suspended from beneath the bust, and the sides of the volutes will be enriched in a similar manner. An unusual feature will be a plan of the Opera House in the form of a bronze panel. It may be mentioned that Messrs. Macdonald supplied a number of the polished pillars which support the main vestibule of the Grand Opera House.

Jean Louis Charles Garnier, architect, who died on August 3rd, 1898, was born at Paris on November 6th, 1825, and studied sculpture and high relief at the Ecole Speciale de Dessin, obtaining several prizes. In 1842 he entered the Ecole des Beaux-Arts, and remained there six years, studying under MM. Leveil and Hippolyte Lebas, and gaining the great prize in architecture in 1848 for his design for a "Conservatoire pour les arts et metiers." Afterwards he travelled in Greece, measured the Temple of Jupiter, in the island of Aegina, a polychromatic design for the restoration of which he exhibited at the Salon des Beaux-Arts in 1853 and at the Exposition Universelle of 1855. Returning to France in 1854, after a short visit to Constantinople, M. Garnier was attached as a sub-inspector to the works at the Tour de Saint Jacques la Boucherie, under M. Ballu. In 1856 he published in the "Revue Archeologique" an explanatory paper relative to the Temple of Aegina. He exhibited various works in water-colours, &c., at the Salons of 1857, 1859 and 1863, obtained a third-class medal in 1857, a first-class medal in 1863, and was decorated with the cross of the Legion of Honour on August 9th, 1864. In 1861 he took part in the open competition for the

new Opera House at Paris; his plans were unanimously adopted by the jury, over which Count Walewski presided, and he was entrusted with the execution of this important work. The building was opened on January 5th, 1875. On this occasion M. Garnier was decorated as an officer of the Legion of Honour. He was appointed Inspector-General of Civil Constructions, Paris, in October, 1877. The new theatre at Monaco, designed by him, was opened in January, 1879. In 1886 M. Garnier visited London, and was presented with the gold medal of the Royal Institute of British Architects.

NEED FOR ELECTRICAL LEGISLATION.

THE committee appointed by the Institution of Electrical Engineers to enquire into electrical legislation in this country has issued their report, in which they state that the cause of the present backwardness is due to the restrictive character of the legislation governing the initiation and development of electric power and traction undertakings, and the powers of obstruction granted to local authorities; that local boundaries have usually no reference whatever to the needs of the community in regard to electric supply and traction, and that the selection of suitable areas should be dealt with on the basis of economic principles and industrial demands; that the development of electric power and traction undertakings offers the most favourable means of relieving congested centres; that it is expedient in the national interests that the Electric Lighting Acts, 1882-8, the Tramways Act, 1870, and the Standing Orders relating to special Acts for tramways should be amended in so far as they enable local authorities to veto or delay the carrying out of electric supply and traction projects of which the utility can be shown, and that effect should be given to the recommendations of the Joint Select Committee of Parliament, 1898, on "Electrical Energy—Generating Stations and Supply." They recommend that the Prime Minister should be memorialised by the Institution to receive a deputation, so that the present disabilities and restrictions should be remedied, and at least the same level attained as in America, Germany and other industrial countries.

South Kensington Examinations in Building Construction.—In our next issue we shall publish concise answers to the questions set in the Advanced Stage.

The Tweed Bridge at Berwick.—The Berwick Town Council have decided to spend £235 on improving the old bridge crossing the Tweed at Berwick. The bridge, which belongs to the Government, is over 250 years old, and is a unique structure which took twenty-four years to build.

A New Presbyterian Church at Reading has been erected in York Road, off the Caversham Road. It is in Perpendicular style, of red bricks with stone dressings. The church consists of a nave and aisles, the nave, 78ft. long and 28ft. wide, being divided from the aisles by an arcading with stone columns with moulded caps and bases. The side aisles are 8ft. 6in. wide. An organ-chamber is ranged on the north side, and a vestry 14ft. by 12ft. 6in. and heating chamber are placed at the rear of the church. A tower and spire 80ft. high is provided at the south-east angle of the building. The interior is finished in red bricks with Taunton stone dressings, and the roof is of pitch-pine unstained, the nave roof being wagon-shaped. The walls are lined to a height of 5ft. with Orham dadoes; the seats are executed in Orham, and the choir seats, communion table and pulpit are in oak. The seating and dado work, &c., was executed by the Bennet Furnishing Co., of London; the lead glazing by Messrs. Morris & Co., of London; the heating by Messrs. Werner, Pleiderer & Perkins, of London; the electric light by the Speedwell Co., Reading; and the fencing by Mr. R. Girdler, of Reading. The organ is by Messrs. Bishop & Son, of London. The seating accommodation is 516, and the total cost, including the organ, was about £5,500. The architect is Mr. W. G. Lewton, of 6, The Forbury, Reading; and Mr. R. Curtis, of Reading, was the builder.

SOUTH KENSINGTON EXAMINATIONS.

(Held on Saturday evening last.)

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—ELEMENTARY STAGE.

[The accompanying illustrations are not reproduced to the required scale. Four hours were allowed for the paper given below. It was permitted to answer only seven questions. Questions marked with an asterisk had accompanying diagrams supplied with the questions. Some of these diagrams it is unnecessary to reproduce.]

*1. For what is this tool used? Sketch it upon your paper, showing the pick better placed, and explain why you alter it. (12)

a. For dressing and cutting roofing slates.

b. See accompanying illustration.

2. Place the pick near the centre of the blade so that when a blow is delivered with it the effect will be, almost, as if the weight of the tool were concentrated in the pick. A tool (hewing-knife, dressing-knife, zax) of the pattern shown in the question would be inefficient and tiresome; a proportion of the shock of each blow with the pick would come upon the hand of the workman.

3. What are Reveals, Jambs, Collar-braces (Collar-beams), Battens, Studs, Deals, Planks, Perpendes, Screeds, King-closer? (12)

a. and b. Of the upright limit of a door or window opening in an outside wall, the portion of wall thickness outside the frame is the Reveal; the portion inside the frame, at whatever angle it meets the inside face, is the Jamb. In inside walls the portions, both sides of frames, are jambs; where there is no frame the whole thickness may be called a jamb.

c. Horizontal pieces fastened to opposing rafters near their middle points.

d. Pieces of timber attached to walls to which plasterers' laths are nailed, or to which wainscoting, &c., is fastened; the pieces to which roofing slates are nailed; timber trade scantlings 7in. by 3in., or to include sizes from 7in. by 4in. to small sizes.

e. Upright pieces to be lathed and plastered on both sides (or boarded) to form partitions.

f. Timber trade scantlings 9in. by 3in., or to include sizes between 9in. by 4in. and battens.

g. Timber trade scantlings 11in. by 3in., or to include sizes between 11in. by 4in. and deals.

h. Exposed joints which are at right angles to horizontal lines or joints.

i. Ridges of plaster worked out from a wall to give the true floated surface of the wall; they guide the darby, &c.

j. A brick, with just so much cut off at one side of one end as to show in the face-work as half a header.

*3. The figure shows in skeleton a bracket for supporting boards from which to do pointing or outside plastering. Sketch the bracket so that an exact drawing could be made from your sketch (marking dimensions). Show clearly how its parts are connected (the parts being of red deal). Show how it is supported. (12)

(See accompanying illustration.)

B is a dovetail notch, A and C are slight abutment joints; the piece E, which keeps the bracket at right angles to the wall, is slightly sunk. The parts are spiked together. The heavy spike D is driven into the brickwork and the bracket is hooked on to it as shown.

Note.—This is not given as the best form of a common piece of jobbing plant; it is not even a good form; but it is sketched from a bracket actually in use, such as might be observed by an elementary student.

*4. What is the name of the bracket of the previous question? If we assume that it carries a uniformly distributed load of 8cwt. on A B, so that we may imagine a downward force of 4cwt. at A, what kind of stress is in A C, and what is its amount? (12)

a. A hanging cripple—a gallows bracket.

b. If we draw the triangle of forces at A to a scale of 1cwt. to 1in., we get for the triangle the skeleton accompanying the question; the stress in A C is compression, and its amount is 5cwt.

5. Given sand, lime, and hair, as delivered at the building, describe in detail how you would prepare "coarse stuff" for plastering—you are not supposed to have a mortar mill. (12)

Run the lime to "putty," place the pieces of burnt quicklime in a vessel containing water; pass the milk through a (3in. mesh) sieve, or riddle, on to a prepared floor of screened sand; when the "putty" (the milk after it has thickened) is cool, and before it becomes too stiff, mix the cow-hair through it in the proportion of about 1lb. of hair to 1 cub. ft. of putty. The hair should be in good condition, well opened out by being beaten with plasterers' laths. It should be evenly mixed by means of a kind of rake. The haired putty is now "tossed" (worked over loosely) with the proper proportion of good, well-screened sand, and then let stand for two or three weeks. The "soured" plaster is "tempered" from the heap for the plasterers (water is added and it is worked with shovels).

6. Sketch neatly, to the scale of about $\frac{1}{8}$, a slate of the dimensions 24in. by 12in. dressed and holed: the lap is 4in. What are the dimensions of the "weather" (or margin) of this slate? What is the distance from the hole to the tail? (12)

(See the accompanying illustration.)

*7. What is the name of the lock shown? Describe how you would fix it to a door. Explain and illustrate by sketches the mechanism of a common single tumbler lock. What are the "wards"? (12)

a. Stock-lock or plate-lock.

b. The lock should be fixed to the door by four bolts having their heads outside and the nuts bearing against the lock inside.

(See illustration.) The tumbler A B F is pivoted at F; the spring E presses it downwards. A projecting spur A keeps the bolt fixed when the spur rests in either of the two notches. As shown, the door is unlocked. To lock the door the key D is turned as shown by a curved arrow; the point D presses up the tumbler against the force of the spring, lifting the spur A out of the first notch on the top edge of the bolt; the bolt is now free to move; the key in its progress engages in the bottom notch carrying the bolt forward with it so that the notch C comes to be below the spur A: further motion of the key allows the tumbler to fall, the spur A rests in the notch C and the door is locked. A side view of the key is shown: the projecting wing of the key is divided into two symmetrical parts by a slit F: a plate having projections upon it shaped to fit the widened portions of the slit is fixed within the lock: this plate and the projection (or projections) are the wards.

*8. The sketch shows a door-frame for an outside door: it is set upon door-blocks and the brick walls are being built to it.

Draw carefully, to the scale of $\frac{1}{16}$, an elevation of the door-frame, step, sill and brickwork (showing the joints by double lines to the left of the door for, say, three bricks from the door): show temporary bracing: describe how you would stay the door-frame temporarily. Draw, to the scale of $\frac{1}{8}$, cross-section of frame at A B, showing the plan of the top course of brickwork; and a short piece of vertical section at C, showing the connection with the door-block. (14)

(See accompanying illustration.)

The temporary braces are nailed on the inside so that they may remain till the frame is completely built in: they have some value in keeping the door-posts from yielding inwards with any pressure from the building. Two raking stays, to keep the frame firmly upright, are shown; their upper ends are spiked to the frame, and their lower ends made secure at the ground.

9. Sketch, to the scale of $\frac{1}{16}$, a sample of sneaked rubble masonry face (say, about 4ft. by 4ft.). Show the mortar joints with double lines.

Sketch also the top of the sample as a plan, showing how you bond the wall across. (14)

(See accompanying illustrations.)

10. A brick wall, 21ft. high (measured from the soil on which it rests), 13 $\frac{1}{2}$ in. thick, carries a load of 1 ton per foot run on its top. Say what is the approximate weight of a cubic foot of brickwork. Draw, to the scale of $\frac{1}{16}$, a cross-

section of the footings on the assumption that the soil is not to be stressed to a greater amount than 1 ton per ft. super. (14)

The approximate weight of a cubic foot of brickwork is 120lbs.

Take 1ft. run of the wall; neglecting the footings and taking the thickness at 14in., it contains 24.5 cub. ft. at 120lbs. = 2,940lbs.; add to this 2,240lbs. (the weight on top of 1ft. run of wall) and we have, say, 2.3 tons to provide for. A width of 28in. would just do, but it is advisable to add an extra half brick. (See illustration.)

11. Describe exactly the laying of batten-width, tongued and grooved common Baltic flooring. How would you manage when the floor has been finished so far that there is no longer room for the cramps between the wall and the finished floor? Sketch the usual flooring nail. What is it called? Where do you drive the nails? Sketch a cross section of a heading joint. (14)

Try the joists for level and evenness of the top edges; see that the flooring-boards are of uniform thickness, and that pieces which are to head are of equal width. I assume that the walls are parallel. Lay a line of boards along one wall and nail them down to the joists; three lines of boards are now laid down, the cramps are clutched to joists, one or more sawing pieces are laid along the outer edge of the boards and the cramps are screwed up against these, so crushing home the flooring, which should now be nailed down. (Heading joints should be neatly fitted and pressed home before the pressure of the cramps is so considerable as to prevent the boards being moved lengthwise.) This operation is repeated until the floor is covered. When the side of the room is nearly reached, the last boards are pressed home by using masons' light setting bars or other levers from the wall. Flooring nail is shown on sketch; it is called a flooring brad. Drive the nails fairly into the joists and within an inch of the edge of the flooring board, as looked down upon (See accompanying illustration.)

*12. For what is the tool shown used? You have to cover a right circular cone with 6lb. lead. The cone is 3ft. in diameter at the base, and it is 2ft. high. Assuming that the joints are butted, what is the weight of the lead? Such a cover being made, if a straight cut is made from the apex to the circumference of the base the cover may be made to lie flat; draw, to the scale of $\frac{1}{16}$, its outline when thus flattened. (14)

The tool is used by plumbers for "dressing" sheet lead.

(See accompanying illustration.)

A B C is an elevation of the cone: its plan is shown below the elevation having its centre marked O. Suppose the straight cut to be the line O P. All straight lines from the apex to the circumference of the base are of the same length, so that the circumference when opened out will lie on that of a circle drawn from O, as centre and radius A B = 2.5ft. From a point Q, step off along the circumference lengths Q P' Q P', each equal to half the circumference of the plan; P' Q P' = circumference of the plan; and the figure O P' Q P' is that of the flattened lead. The area of this figure is $\frac{\text{arc} \times \text{radius}}{2}$

11.78 sq. ft., which, at 6lbs. to the foot, gives the weight as 70.68lbs.

13. What is bond in brickwork? When you say that a certain wall is built in Flemish bond, to what do you refer? You have to build a $1\frac{1}{2}$ brick wall, showing Flemish bond in one face—the appearance of the other face is of no consequence, as it is to be plait red. No bats are allowed. Sketch the plan of a course, say, 5 bricks long, in full lines, and show the joints of the course below in dotted lines. (15)

Bond has reference to the modes of laying bricks so that they interlock with one another. When the exposed surface of a brick wall shows alternate header and stretcher in each course, every header being laid on the middle part of a stretcher of the course below, the work is assumed to be in Flemish bond.

(See accompanying illustration.)

14. Describe carefully the work of laying a kitchen floor with 6in. by 6in. tiles $\frac{1}{2}$ in. thick, in two colours. The floor is 14ft. by 13ft.: how many tiles ought to be ordered for the work? (15)

Assuming the floor to be prepared for tiling by having a proper concrete surface on which

(1)

Solution to Question 1.

Hole 3
Margin 10
Tail 12
14

Solution to Question 6.

A B C D E F

Solution to Question 7.

Elevation.
Sneek or Jink.

Solution to Question 9.

(3-4)
A B C
3 4 5

Solution to Question 3.

(8)
A B C D E
3 4x2 4x1 1/2 4x1
Iron pin
Ring
Stone
Stiff paint.
Temporary Braces & Slays

Solution to Question 8.

Elevation.
Plan.

Solution to Question 9.

A B

Solution to Question 8.

to lay the tiles, two true pieces of wood about 3in. wide are laid down, nailed to the concrete or held down by weights, at such a distance apart as shall be convenient. The tops of these pieces shall truly give the surface of the finished floor; the pieces shall be parallel. The tiles, having been well soaked in water, are carefully laid on a bed of fine cement-mortar (laid on the concrete as the tiling proceeds) and pressed down as is shown to be necessary by a straight-edge laid across the screeds (as the pieces of wood may be called). When the space between the screeds is filled with tiles one screed is moved out so far as is necessary for an additional band of tiles, and so on till the floor is covered.

(The common tiles used for kitchen floors are thicker than half an inch, red tiles are about three-quarters of an inch, and blue or black tiles are quite an inch in thickness.) There will be an amount of cutting of tiles; this is done by means of a hammer and chisel.

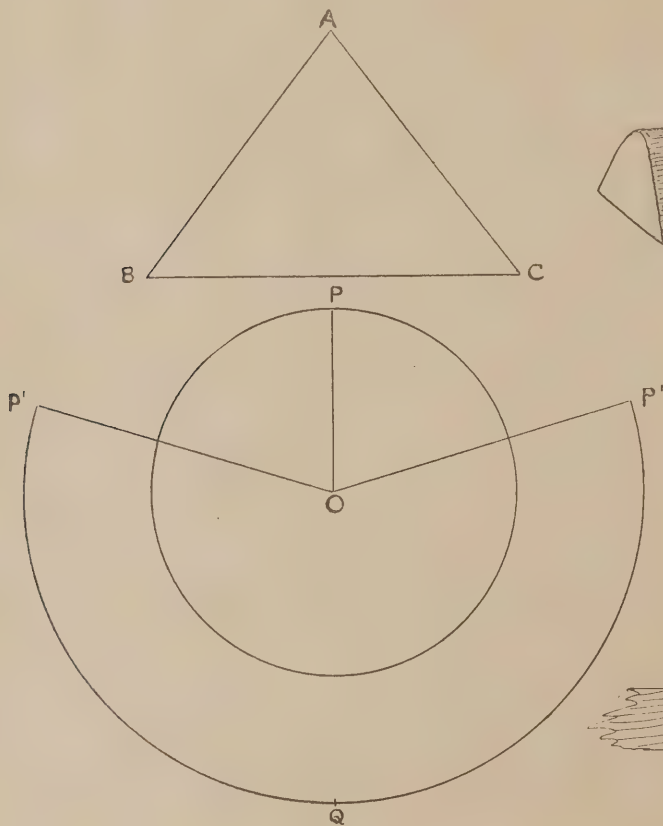
$14 \times 13 \times 4 = 728$, gives the net number of tiles which will cover the area; but allowance must be made for (a) defective tiles, (b) cutting and breakages. If the tiles are laid in lines making 45° with the walls (as is frequently done) there will be a good deal of waste from cutting and breakages. Assuming that 22 extra tiles will be enough to order, there will be 375 tiles of each colour needed, say, 750 tiles.

Law Cases.

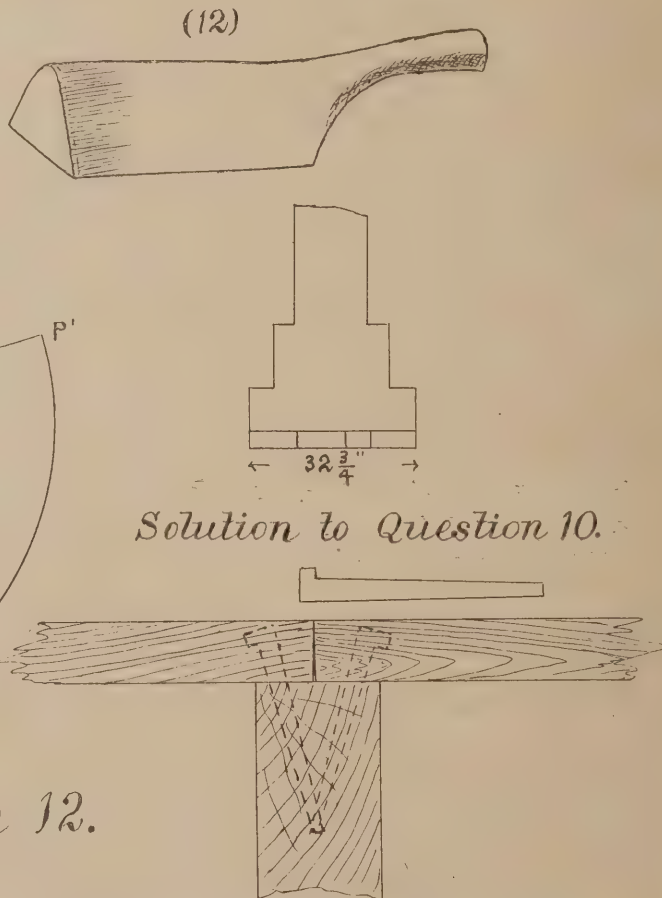
Apprentice Masons: Important Appeal Case.—

On Saturday last judgment was delivered in the case of *Reed v. Friendly Society of Operative Stonemasons and others*, heard in the King's Bench Division of the High Court of Justice a fortnight ago. It appeared that the plaintiff, having worked for some time as a labourer for Messrs. Wigg & Wright, stonemasons, Ipswich, at 15s. a week wages, became desirous of improving his position, and entered into an indenture of apprenticeship with the firm under which he was to continue to work for them for three years and to receive 15s. a week, and they were to instruct him in the trade. Thereupon the secretary of the Friendly Society threatened that unless the firm ceased to teach the trade of stonemason to the plaintiff he would call out the workmen on strike. The rule alleged to have been broken was to the effect that boys entering the trade should not work more than three months without having legally been apprenticed, and in no case were they to be more than sixteen years of age when apprenticed, except they were mason's sons or stepsons. It was also provided that the employers should have one apprentice to every four masons on an average. The plaintiff was twenty-five years

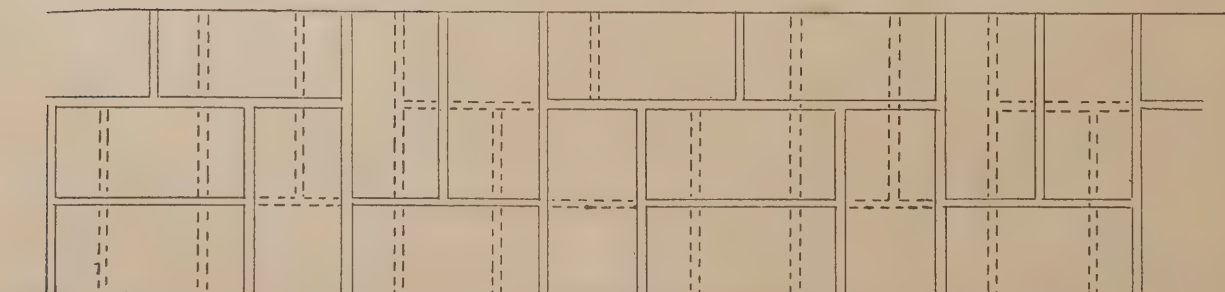
of age, but as he was the son of a stonemason the firm did not think they were breaking the rule by admitting him to apprenticeship. Under the threat of a strike, however, they reduced the plaintiff to his original position of a labourer. Plaintiff then claimed damages from the defendants for having conspired to induce Messrs. Wigg & Wright to break the agreement of apprenticeship. The county court judge held that there was no cause of action against the defendants, who seemed to have acted *bona-fide* in the interest of the Society, and were not actuated by improper motives. Against that decision the present appeal was entered.—Mr. Justice Darling said it seemed to him that the view of the learned judge was wrong, and that there should be a new trial. On the question of justification it was not enough that the defendants acted *bona-fide* in the best interests of the Society—that was, in their own interests—and it was not enough that they were not actuated by improper motives, or that they honestly acted on a wrong understanding of the rules of the Society to which the plaintiff's employers had subscribed. Mr. Justice Channell concurred. The Lord Chief Justice said that the judgment of the county court judge was unsatisfactory. Judgment should have been entered for the plaintiff. The appeal was accordingly allowed with costs, and the case sent back for a new trial.



Solution to Question 12.



Solution to Question 11.



Solution to Question 13.

Face-this Side

New Companies.

Builders' Wholesale Supply, Ltd.

Registered to carry on business as builders' merchants, builders and contractors, decorators, and dealers (both wholesale and retail) in stone, sand, lime, bricks, tile and terra-cotta, paviors, ironfounders, mechanical engineers, tool makers, brass founders, metal workers, &c. Capital £5,000 in £1 shares.

Central Counties Land Development Co., Ltd.

Registered to acquire any lands, buildings, hereditaments or premises of any tenure or class; as dealers in timber, hardware, building materials, shipowners, &c. Capital £1,000 in 900 £1 preference shares and 2,000 ls. deferred shares. Registered office: 57½, Old Broad Street, E.C.

Corporation Road Cottage Co., Ltd.

Registered to carry on the business of a land, building, insurance and investment company in England or Wales. Capital £5,000 in £10 shares.

Craig Sharp, Ltd.

Registered to manufacture and deal in paints, pigments, lacquers and chemicals. Capital £2,000 in £1 shares.

W. P. Embrey, Ltd.

Registered to adopt an agreement with H. P. Embrey; and to carry on the business of joiners, builders, blacksmiths, general contractors, and otherwise, now carried on by H. P. Embrey at the King Street Saw Mills, Fenton, Staffordshire. Capital £8,000 in £10 shares. Registered office: King Street Saw Mills, Fenton, Staffordshire.

Harrogate and District Building Trades' Exchange Co., Ltd.

Registered to provide an exchange and clubhouse and other conveniences for the use of members; to acquire and turn to account any real or personal property, land, buildings, &c. Capital £1,000 in £1 shares. Registered office: 7, Cambridge Road, Harrogate.

Model Land and Property Co., Ltd.

Registered to acquire any lands, estates, real or personal property of any tenure, and to develop, deal with and turn to account the same in Liverpool or elsewhere; as builders and contractors; dealers in stone, bricks, pipes, terra-cotta and building materials of all kinds. Capital £3,000 in £1 shares. Lizzie Kate Hesketh, of 12, Fletcher Grove, Liverpool, is the first director.

Mountain Ash Land and Building Co., Ltd.

Registered to carry on the general business of a land company; as auctioneers, surveyors, land, house and estate agents, builders, contractors, dealers in cement, timber and hardware, stone, sand, lime, bricks, &c. Capital £7,500 in £10 shares. Registered office: Ffrwd Office, Mountain Ash, Glamorganshire.

T. R. Nicholls, Ltd.

Registered to acquire (1) the business of a timber and joinery merchant carried on by R. Nicholls at Wharf Street, Stoke-on-Trent, Tunstall, and Shelton Wharf, all in Staffordshire, and (2) the business carried on by the Midland Timber and Moulding Mills Co., Ltd., at Cliffe Vale, Stoke-on-Trent; and to carry on the business of timber importers and merchants, general builders' merchants, joiners, builders, contractors, &c. Capital £25,000 in £1 shares (15,000 preference).

North Drive (St. Anne's-on-Sea) Land Co., Ltd.

Registered to acquire lands and buildings at St. Anne's-on-Sea or elsewhere in Lancashire, and to develop and turn to account the same by laying-out or preparing for building or other purposes, &c. Capital £10,000 in £10 shares. Registered office: 13, St. Anne's Road West, St. Anne's-on-Sea, Lancashire.

Priory Estate Co., Ltd.

Registered to acquire any lands and buildings in the county of Worcester or elsewhere, in particular certain freehold and leasehold hereditaments and premises situate in or about King's

Heath, Worcester; to carry on business as builders and contractors, decorators, merchants, dealers in stone, sand, lime, bricks, timber, hardware and other building requisites; brick, tile, drain-pipe and terra-cotta makers; job-masters, carriers, house and estate agents, &c. Capital £50,000 in £10 shares. The first directors are J. H. Cartland, F. H. Cartland and J. F. H. Cartland. Registered office: 13, Bennett's Hill, Birmingham.

P. & R. Syndicate, Ltd.

Registered to carry on the general business of a land development company in London or elsewhere; as producers and suppliers of gas and electricity, &c. Capital £5,000 in £1 shares.

Watson-Nelson, Ltd.

Registered to acquire the business of brick and tile manufacturers and merchants, clay workers, potters, manufacturers of and dealers in terra-cotta, stoneware and plastic materials or products carried on at Napton, Warwick, by C. Watson. Capital £30,000 in £1 shares. The first directors are G. B. Blyth (chairman), C. E. Blyth and C. Watson. Registered office: The registered office of Charles & Co., Ltd, Stockton, Warwick.

ARCHÆOLOGY AND ARCHITECTURE IN ITALY.

The Successful Action of the Government.

THE King of Italy recently visited the Roman Forum, and Signor Boni, director of the excavations, took occasion to point out to his Majesty the incongruity of leaving the site of the Roman Senate covered up by a comparatively modern Spanish convent. Signor Boni's proposal has commended itself to a number of Italian public men, who have drawn up a motion calling on the Minister of Public Instruction to provide means for the demolition of the convent and the excavation of the site; and as it is practically certain that Signor Nasi, Minister of Public Instruction, will make no objection, it is hoped that within the next year the remains of the old Roman Senate will be brought to light after being buried for so many centuries. The special correspondent of the "Morning Post" observes that this is not the only proof of the new interest which the Italian Government and, in particular, the Fine Arts and Antiquities Department of the Ministry of Public Instruction, are taking in the preservation of ancient Italian monuments. Efforts are being made, and as a rule successfully, to prevent a recurrence of the blind demolition of venerable remains that went on in Italy twenty years ago. One illustration of this is the action of the Ministry of Public Instruction on behalf of the old walls of Bologna. It was proposed to destroy the ancient structure almost entirely as a result of the growth of the city. The Ministry has succeeded in obtaining the suspension of the demolition which had been begun at three points, and has made sure that any partial demolition that may be rendered necessary by the growth of traffic and the need for more direct communications shall in no way harm the monumental value of the old walls. At Genoa the Ministry of Public Instruction has averted the danger that threatened the beautiful cloister of Sant' Andrea. The Genoese municipality wished to buy the cloister from the prison's administration, to which it belongs, in order to sell the area to private speculators. The Ministry of the Interior, at the request of the Ministry of Public Instruction, has, by its intervention, prevented such a misfortune. Similar intervention at Novara has saved the Sforza Castle from being sold to the municipality and damaged. At Verona a regular campaign has been necessary to prevent the destruction of the famous Piazza delle Erbe, where local vandals wished to erect a large modern theatre. The Piazza Civica at Pistoja is still threatened by the promoters of a monument to Garibaldi, who wish it to be placed at the side of the statue to Cardinal Forteguerri. Here, again, the Department of Antiquities is gradually persuading the local enthusiasts for Garibaldi not to spoil the symmetry of the Piazza with a modern monument, but to place their statue elsewhere.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BARNES.—For extension of Castelnau School, for Barnes School Board. Mr. G. Innes, architect, 50 Cannon Street, E.C. 4.—
Houghton & Co., Ltd. ... £2,182 0 0
Martin, Wells & Co., Ltd. ... 1,850 0 0
H. Roffey ... 1,790 0 0
Chessum & Sons ... 1,743 0 0
W. Lowe ... 1,680 0 0
B. E. Nightingale ... 1,673 0 0
W. J. Renshaw ... 1,642 0 0
Richards & Co. ... 1,640 0 0
Lathey Bros. ... 1,633 0 0
W. Keys ... 1,630 0 0
J. Knight ... 1,625 0 0
* Accepted.

BEXHILL.—For levelling, paving, metalling, kerbing, channeling, and making-up of certain roads and laying out promenades on the west parade, for the Bexhill Urban District Council. Mr. Geo. Ball, A.M.I.C.E., surveyor:—
Peerless, Dennis & Co., Eastbourne ... £9,343 0
J. C. Trueman, Swanley Junction, Kent ... 8,500 0
W. Winney & Co., Hammersmith, W. ... 8,292 0
J. Grey, Bexhill ... 8,180 5
T. Adams, Green Lanes Goods Station, Wood Green ... 7,939 0
* Accepted.

BRANKSOME (DORSET).—For the construction of new roads and sewers on the Penn Hill Park Estate, Branksome, Dorset, for Penn Hill Park, Ltd. Mr. J. E. Clifton, F.S.I., Swanage, Dorset, surveyor:—
H. & J. Hardy, Swanage ... £2,900 0 0
Case Syndicate, London ... 2,886 10 11
F. Jenkins, Fairfield, Christchurch ... 1,630 0 0
Grounds & Newton, Bournemouth ... 1,563 0 0
S. Saunders, Upper Parkstone ... 1,514 15 6
G. Maltmain, Poole, Dorset ... 1,523 0 0
G. T. Budden, Newtown, Parkstone ... 1,483 14 7
S. Saunders, London, S.W. ... 1,460 0 0
H. C. Brice, Newtown, Parkstone ... 1,393 9 0
* Accepted.

CELLARDYKE (SCOTLAND).—For the rebuilding and extension of piers and relative works at Cellardyke Harbour, for the Town Council. Mr. W. A. Baird Laign, C.E., engineer, 13 George Street, Edinburgh:—
D. & G. Stratton, 26 Shandwick Place, Edinburgh ... £3,346 0 0
A. Cameron, Bonnington Grove, Edinburgh ... 2,550 0 0
J. Martin, 3 Queen Anne Street, Dunfermline ... 1,078 17 0
R. C. Brebner & Co., 5a St. Andrew Square, Edinburgh ... 1,671 0 0
J. Adams & Co., 401 Pollokshaws Road, Glasgow ... 1,057 8 4
* Accepted.

ESHER.—For the erection of a new post office at Esher, for H.M. Office of Works, &c.:—

	£	s.	d.
J. Longley & Co., ...	4,250	0	0
G. S. Heasler, ...	3,650	25	
E. Potterton, ...	3,612	25	
E. Wells, ...	3,570	25	
J. Appleby, ...	3,570	25	
Cropley Bros., Ltd., ...	3,547	20	
F. Shute, ...	3,547	11	
C. Jackson, ...	3,534	—	
Haslemere Builders, ...	3,528	25	
P. E. Nightingale, ...	3,513	25	
Viney & Stone, ...	3,490	22	
F. Hawkey, ...	3,450	25	
J. Wheatley & Sons, ...	3,450	19	
T. J. Messom & Sons, ...	3,443	10	
C. Oldridge & Son, ...	3,431	10	
Wisdom, ...	3,401	10	
T. G. Sharpington, ...	3,347	10	
W. H. Lorden & Son, ...	3,333	—	
Turtle and Appleton, ...	3,315	20	
Higby & Labson, ...	3,290	20	
Speechley & Smith, ...	3,250	21	
D. Jackson, ...	3,241	21	
W. H. Young, ...	3,200	75	
W. H. Gaze & Son, ...	3,193	55	
Harris & Rowe, Ltd., ...	3,100	25	
Newland & Higgs, ...	3,017	20	
H. Flint, ...	2,920	20	
T. Vaughan, ...	2,645	20	

* Accepted. A. Old materials. † Withdrawn.

FAIRFIELD, NEAR MANCHESTER.—For the erection of three shops for Mr. T. E. Eastwood. Messrs. J. H. Burton and J. A. Percival, architects, 150a Stamford Street, Ashton-under-Lyne.

	£	s.	d.
Jas. Downham, Widnes ...	1,768	7	4
Smith & Mason, Gorton ...	1,750	0	0
E. Marshall, Ashton-under-Lyne ...	1,279	0	0
Z. Pike & Son, Hooley Hill ...	1,274	0	0
A. Mellor, Openshaw ...	1,250	0	0
J. Gibson & Son, Dukinfield ...	1,225	0	0
S. How & Taylor, Ashton-under-Lyne ...	1,225	0	0
A. Floyd, Miles Platting ...	1,205	0	0
Fitton & Bowness, Ashton-under-Lyne ...	1,183	0	0
J. Robinson, Ashton-under-Lyne ...	1,183	0	0
Jas. Ridyard, Ashton-under-Lyne ...	1,170	0	0
E. Kirkby, Ashton-under-Lyne ...	1,160	0	0
F. Dean, Ashton-under-Lyne ...	1,160	0	0
H. Fielding, Droylsden ...	1,150	0	0

* Accepted.

	£	s.	d.
Geo. Pybus, Openshaw ...	2,231	0	0
Geo. Burrows & Co., Ashton-under-Lyne ...	226	0	0
H. Pike, Hooley Hill ...	222	10	6
J. Almond, Manchester ...	197	0	0
G. H. Coup, Ashton-under-Lyne ...	195	0	0
B. H. Scholes, Ashton-under-Lyne ...	194	0	0
J. Nicholls, Manchester ...	194	0	0
H. Rigby, Dukinfield ...	190	0	0
P. Willis, Ashton-under-Lyne ...	188	10	0
S. Marsden, Stalybridge ...	188	0	0
F. Bowden, Ashton-under-Lyne ...	187	0	0
J. W. Heginbottom, Droylsden ...	187	0	0

* Accepted.

HULL.—For certain plant and work required to be executed at

Sculcoates Lane generating station, for the Electric Lighting Committee: (Contract 30) pipe-work, pumps, motors, &c.:—
Barker & Aspley, Hull ... £3,416 0 0
Rose, Downs & Thompson, Ltd., Hull ... 3,767 0 0
Maxim Electrical & Engineering Co., Ltd., ... 3,676 0 0
Babeock & Wilcox, Ltd., London ... 3,502 0 0
Crompton & Co., Ltd., London ... 3,516 0 0
Kortling Bros., London ... 3,450 9 2
Aiton & Co., London ... 3,360 0 0
Thornton & Crabtree, Bradford ... 3,312 0 0
J. Spencer, Ltd., Wednesbury (informal) ... 3,207 0 0
* Accepted.

HUNSTANTON.—For the erection of a house at Hunstanton for Mr. H. J. Finch. Mr. Herbert J. Green, architect, 31 Castle Meadow, Norwich:—

	£	s.	d.
John Cracknell, Peterboro' ...	21,881	8	0
E. Giddings, St. Ives, Hunts ...	1,813	7	10
P. Banyard, Cambridge ...	1,748	0	0
F. Southgate, Hunstanton ...	1,070	0	0
Chambers & Son, Snettisham ...	1,059	0	0
Reuben Shanks, Chatteris, Cambs ...	1,059	0	0

* Accepted conditionally.

LONDON, S.E.—For the erection of new offices, nurses' home, relief station and lodge adjoining their infirmary in Brook Street, Kennington Road, S.E., for the Guardians of Lambeth:—

	£	s.	d.	Period for Completion in Months.
Baham Bros.	45,305	...	...	24
H. Willcock & Co., Wolverhampton	43,730	...	...	18
W. King & Son ...	42,408	...	...	24
J. Appleby ...	41,746	...	...	24
C. Ansell ...	41,720	...	...	24
Patman & Fotheringham, Ltd.	40,968	...	...	20
I. & M. Patrick ...	40,000	...	...	24
H. Kent ...	40,302	...	...	24
H. L. Holloway ...	40,382	...	...	20
E. Lawrence & Sons ...	39,871	...	...	18
McGormick & Sons ...	39,868	...	...	24
Kirk & Randall ...	39,720	...	...	17
J. R. Ward ...	39,500	...	...	24
Harris & Wardrop ...	39,398	...	...	24
B. E. Nightingale ...	39,455	...	...	24
C. Dearing & Son ...	39,225	...	...	21
L. Whitehead & Co., Ltd.	39,280	...	...	21
F. & H. F. Higgs ...	39,103	...	...	18
E. J. Saunders ...	39,250	...	...	18
J. Shillitoe & Son ...	39,000	...	...	12
Maple & Co., Ltd. ...	39,132	...	...	24
H. Burman & Sons ...	38,955	...	...	21
Holliday & Greenwood ...	38,747	...	...	20
F. C. Minter ...	38,800	...	...	—
C. Gray Hill ...	38,200	...	...	15
J. Greenwood ...	38,583	...	...	24
Treasure & Son ...	37,460	...	...	24
W. Lawrence & Son, Waltham Cross, N.	37,830	...	...	20

* Accepted

CHAM, SUTTON (SURREY).—Accepted for Block No. 2, of six cottages, for Messrs. C. T. Brock & Co., including fencing in site, paving yard, drainage, &c. Messrs. Barrett and Driver, Architects, 55 Blomfield Road, Malda Vale, W. :—

W. Martin, Croydon ...	£1,130
IPSWICH.—For alterations to the Ipswich Institution, Messrs. William Eade, F.R.I.B.A., and Edwin Thomas Johns, architects, Cornhill Chambers, Thoro'fare, Ipswich. Tenders were opened for the above with the following result:—	
V. A. Marriott ...	£2,100 0
H. J. Linzell ...	1,895 0
W. H. Death ...	1,975 0
C. Roper ...	1,945 10
G. Gilmwood & Sons ...	1,850 0
A. A. vis ...	1,860 0
A. Sadler ...	1,797 10
T. Parkington & Son ...	1,755 0

* Accepted.

IPSWICH.—For the erection of a new Wesleyan Chapel, Bramford Road. Messrs. William Eade, F.R.I.B.A., and Edwin Thomas Johns, architects, Cornhill Chambers, Thoro'fare, Ipswich:—

	Extra for wood block floor	£	s.	d.
A. A. vis ...	—	43,050	0	—
Harris & Rowe ...	—	3,597	0	—
Spencer Santo & Co. ...	£70 0 0	3,465	0	—
H. Gayford ...	90 0 0	3,430	0	—
V. A. Marriott ...	95 0 0	3,435	0	—
H. J. Linzell ...	70 0 0	3,385	0	—
E. Adams ...	109 16 0	3,301	17	—
E. Catchpole ...	94 0 0	3,350	0	—
F. C. Thurman ...	—	3,280	0	—
T. Parkington & Son ...	84 0 0	3,150	0	—
W. H. Death ...	110 0 0	3,050	0	—
C. Roper ...	92 0 0	3,019	0	—

* Accepted.

LONDON, E.C.—For offices, 89 Gresham Street, E.C., decoration, &c. Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, architects, 5 Clements Inn, Strand, W.C. :—

Battley, Sons, and Holness ...	£108
Collingwood & Co. ...	148
W. H. Lascelles & Co., 121 Bunhill Row, E.C. ...	187

* Accepted.

LONDON, S.E.—For alterations to 63 Canterbury Road, Hat-cham, for Messrs. John Dicks. Mr. D. G. Mootham, architect:—

W. H. Drake ...	£5,000	W. Downs ...	£5,138
Martin, Wells & Co. ...	5,490	W. Wallis ...	5,850
G. Andrews & Co. ...	5,473	J. Jarvis ...	5,270

NEWCASTLE-ON-TYNE.—For the erection of shops and offices, for Mr. R. Emmerson. Mr. R. E. Simpson, architect, 12 Grey Street, Newcastle-on-Tyne. Quantities by the architect:—

J. C. Hope ...	£35,944	9	8
J. & W. Lowry ...	35,883	0	0
I. Bewlay ...	35,218	3	0
T. Weatheritt ...	34,250	0	0
S. Easton ...	34,190	0	0
G. H. Mauchlen ...	33,051	10	0
Middlemiss Bros. ...	33,000	0	0
S. Sheriff ...	32,309	0	0
J. & G. Douglass ...	32,383	0	7
Parkinson & Son, Ltd. ...	32,074	0	0
J. L. Miller ...	31,162	2	2
T. P. Shaftee ...	30,833	12	0
W. B. Weir, Howdon ...	30,940	0	0

* Accepted.

NEWMARKET.—For the following works, for The Guardians: new female infirmary, additions to male infirmary, nurses' home, maternity ward, administration buildings, laundry, porter's lodge, receiving wards, alterations to existing buildings, and other works connected therewith. Messrs. Holland & Sons, architects, High Street, Newmarket. Quantities by Mr. Sam G. Thacker, 90 High Holborn, London, W.C. :—

Kettering Co-operative Builders, Ltd. ...	£33,273	0
K. S. Kimberley, Banbury ...	30,117	0
J. Norris & Sons, Sunningdale, Ascot ...	29,600	0
F. C. Thurman, Walton, near Ipswich ...	28,968	0
J. McKay, Clacton-on-Sea ...	28,800	0
J. Cracknell, Peterborough ...	28,820	0
F. G. Minter, Westminster ...	28,280	0
H. Vickers, Nottingham ...	28,157	0
Oak Building Company, Cambridge ...	28,000	0
J. J. Wise, Deal ...	27,450	0
Coulson & Lofis, Cambridge ...	26,900	0
J. G. Cowell, Soham, Cambs. ...	26,950	0
C. Roper, Ipswich ...	26,777	0
A. J. Bateman, Ramsey, Hunts ...	26,787	10
S. A. Kenney, Ipswich ...	25,880	0
Maple & Co., London, W. ...	25,873	0
H. J. Linzell, Stowmarket ...	25,870	0
W. Saint, Cambridge ...	25,800	0
Grimwood & Sons, Ipswich ...	25,800	0
Kerridge & Shaw, Cambridge ...	25,463	0
Grimwood & Sons, Sudbury ...	23,989	0
J. Shillitoe & Sons, College Lane, Bury St. Edmunds ...	23,900	0

* Accepted provisionally.

* Withdrawn.

PONDERS END (MIDDLESEX).—Accepted for the construction of new road and sewer on the Durants Arbour Estate, for the Enfield and District Land Co., Ltd. Messrs. Michael Faraday and Rogers, Surveyors, Ponders End:—

E. J. Betts, Enfield Highway ...	£250
SALISBURY.—For the erection of new shop and premises, Blue Boarway. Mr. A. C. Bothams, A.M.C.E., architect, Salisbury:—	
Vincent & Folland ...	£2,230
Wort & Way ...	2,098
Kite ...	2,116
Harris Bros. ...	2,075

* Accepted.

SHENFIELD (ESSEX).—For the erection of a residence at Shenfield, Essex, for Mr. H. H. Keddell. Messrs. George Baines, F.R.I.B.A., R. Palmer Baines, architects, 5 Clements Inn, Strand, W.C. :—

S. J. Scott ...	£2,450	Battley Sons & Holness ...	£2,193
G. J. Hosking ...	2,424	Brown & Son ...	2,192
J. Chessum & Sons ...	2,420	Hammond & Son ...	2,180
Furtile & Appleton ...	2,346	F. & H. F. Higgs ...	2,152
A. & J. Cross ...	2,314	E. West (Chelmsford) ...	1,983
W. Johnson & Co., Ltd. ...	2,279		

* Accepted with slight reductions.

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FORAGE.		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	—	—	—
Clover, best ..	per load	4	15	0	5	10	0
Hay, best ..	do.	5	5	0	5	12	6
Sainfoin mixture ..	do.	4	10	0	5	5	0
Straw	do.	1	13	0	2	4	0

OILS AND PAINTS.		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	5	8	1	6	10
Coza Oil, English ..	do.	1	5	8	—	—	—
Copperas	per ton	2	0	0	—	—	—
Lard Oil	per cwt.	2	9	6	—	—	—
Lead, white, ground, carbonate ..	do.	1	4	10	—	—	—
Do. red	do.	1	0	4	—	—	—
Linseed Oil, barrels ..	do.	1	11	3	—	—	—
Petroleum, American ..	per gal.	0	0	6	0	0	7
Do. Russian	do.	0	0	5	0	0	6
Pitch	per barrel	0	7	0	—	—	—
Shellac, orange ..	per cwt.	5	19	0	—	—	—
Soda, crystals ..	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	10	6	1	11	0
Tar, Stockholm ..	per barrel	1	2	6	—	—	—
Tar, pitch	per cwt.	1	12	7	—	—	—

METALS.		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	69	0	0	—	—	—
Iron, Staffs, bar ..	do.	6	7	6	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	15	0	12	0	0
Lead, pig, Soft Foreign ..	do.	11	15	0	—	—	—
Do. do. English common brands ..	do.	12	0	0	—	—	—
Do. sheet, English 3lb per sq. ft. and upwards ..	do.	13	0	0	—	—	—
Do. pipe	do.	13	10	0	—	—	—
Nails, cut clasp, 3in. to 6in. ..	do.	9	0	0	—	—	—
Do. floor brads ..	do.	8	15	0	—	—	—
Steel, Staffs, Girders and Angles ..	do.	5	15	0	6	5	0
Do. do. Mild bars ..	do.	6	10	0	7	0	0
Tin, Foreign	do.	129	0	0	129	10	0
Do. English ingots ..	do.	130	0	0	131	0	0
Zinc, sheets, Silesian ..	do.	21	0	0	—	—	—
Do. do. Vieille Montaigne ..	do.	21	10	0	—	—	—
Do. Speiter	do.	18	2	6	18	7	6

TIMBER.		£	s.	d.	£	s.	d.
SOFT WOODS.							
Fir, Dantzic and Memel ..	per load	2	1	0	—	—	—
Pine, Quebec, Yellow ..	per load	4	7	6	6	0	0
Do. Pitch	do.	2	14	0	3	11	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	10
Do. Petersburg ..	per bundled	0	8	—	—	—	—
Deals, Archangel 2nd & 1st per P. Std. 16 ..	do.	24	15	0	24	15	0
Do. do. 4th & 3rd ..	do.	10	15	0	14	5	0
Do. do. unsorted ..	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	12	10	0
Do. Petersburg 1st Yellow ..	do.	10	0	0	17	5	0
Do. do. 2nd	do.	9	0	0	12	10	0

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
May 8	Chesterfield—Stores, &c.	Co-operative Society	G. Haslam & Son, Euclid House, Ilkerton.
8	Leeds—Foundations and Side Walls to 5 Greenhouses	St. Pancras Parish Guardians	City Engineer, Leeds.
8	London, N.W.—Receiving Home for Children	County Council	A. E. Pridmore, 2 Broad Street Buildings, E.O.
8	Londonderry—Alterations, &c., to Court House	Corporation	County Surveyor, Court House, Londonderry.
8	Cardiff—Boundary Wall		W. Harpur, Borough Engineer, Town Hall, Cardiff.
8	Huntley—Houses, Sheds, Stables, &c.	Agricultural Society	Factor's Office, Huntley.
8	Newport, Salop—Fitting-up Show-ground		W. H. Burton, Hon. Secretary, Newport, Salop.
9	Newchurch-in-Pendle—Re-roofing, &c., Church		Vicarage, Newchurch-in-Pendle.
9	Bingley, Yorks—Rebuilding Engineering Works and Warehouse.	R. Garnett	W. R. Nunns, Architect, Market Street, Bingley.
9	London, S.W.—Relaying Ward Floors	Fulham Borough Guardians	E. J. Mott, Clerk, Fulham Palace Road, Hammersmith, W.
9	Birmingham—Repairs, &c., to Buildings	Commissioners of H.M. Works	Assistant Architect, H.M. Office of Works, Pinfold St., Birmingham.
10	Bundoran, Ireland—Rebuilding House		W. S. Jervois, Architect, Armagh.
10	Derby—Asylum Extension	Asylum Committee	B. S. Jacobs, Architect, Lincoln's Inn Bldgs., Bowldale Ln., Hull.
10	Durrow, Ireland—Completing Church Tower, &c.	Very Rev. Canon Shortall	W. H. Byrne, 20 Suffolk Street, Dublin.
10	Uxbridge—Sunday Schools		Heron & Blairs, and W. L. Ever, High Street, Uxbridge.
10	Aberystwyth—Stone Bridge over River Paris	Rural District Council	H. Hughes, 8 Market Street, Aberystwyth.
10	Loughborough—Extensions, &c., to Police Court	Leicestershire County Council	S. P. Pick, 6 Millstone Lane, Leicester.
10	Beaufort, Wales—Repairs and Renovations to Chapel		H. Waters, Beaufort.
10	Blairgowrie, Scotland—Reconstructing Mill		L. Falconer, 27 Bank Buildings, Blairgowrie.
10	Ennisecorthy, Ireland—Show Buildings, &c.	Ennisecorthy Sports Syndicate	E. S. O'Brien, Westown House, The Westgate, Wexford.
10	Llangadock, Wales—Classroom, &c.	School Board	J. F. Morgan, High Gate, Llangadock.
10	Llanharan, Wales—House and Shop		J. Smith, G.W. Cottages, Llanharan.
10	Woodland, Durham—School and Temperance Hall		I. Tarn, Zetland House, Woodland.
10	Caeathraw—Isolation Hospital Buildings, &c.	Gwyrfael Rural District Council	J. Griffith, District Surveyor, Segontium Terrace, Carnarvon.
10	Fleur-de-Lis, Pengam—Parish Hall and Classrooms.	Rev. J. George	E. M. B. Vaughan, Architect, Cardiff.
10	Porthcawl—Bungalows	T. D. Bevan	G. F. Lambert, Architect, Bridgend.
10	Leeds—Chapel and School	Primitive Methodist Congregation	T. & C. B. Howdill, 7 Oxford Row, Leeds.
10	West Malling, Kent—Work at Workhouse	Union Guardians	W. L. Grant, Architect, Sittingbourne.
12	New Cross, Manchester—Urinal Stalls in Underground Lavatory.	Manchester Corporation	City Surveyor, Town Hall, Manchester.
12	Cheetham, Manchester—Electricity Sub-Station	Manchester Corporation	City Surveyor, Town Hall, Manchester.
12	Cheetham Hill, Manchester—Electricity Sub-Station.	Manchester Corporation	City Surveyor, Town Hall, Manchester.
12	Harpurley, Manchester—Electricity Sub-Station	Manchester Corporation	City Surveyor, Town Hall, Manchester.
12	Openshaw, Manchester—Electricity Sub-Station	Manchester Corporation	City Surveyor, Town Hall, Manchester.
12	Brighton—Boundary Wall, &c.	Corporation	F. J. Thilstone, Town Clerk, Town Hall, Brighton.
12	Burnley—Church and Schools	Urban District Council	J. B. Thornley, 45 Market Street, Darwen.
12	Carlow, Ireland—Twenty-seven Labourers' Cottages.		J. Byrne, Borough Surveyor, Town Hall, Carlow.
12	Llanbedrog, Anglesea—Board School, &c.	Urban District Council	J. Owen, Architect, Menai Bridge.
12	Bishop's Stortford—Additions to Offices.	School Board	R. S. Scott, Surveyor, North Street, Bishop's Stortford.
12	Walsall—Alterations and Additions to Schools	Llandebie School Board	Bailey & McDonnell, Architects, Bridge Street, Walsall.
12	Myndydeirig, Wales—School	Great Western Railway Co.	D. Jenkins, Architect, Llandilo.
12	Pontypool Road—Transfer Shed	Urban District Council	Engineer, Newport Station.
12	Mytholmroyd—Retaining and Fence Wall	Management Committee	S. Sutcliffe, Surveyor, Council Offices, Mytholmroyd.
12	Donabate, co. Dublin—Gate Lodge, Cottages, &c.	Corporation	G. Lennon, Clerk, Richmond Asylum Offices, Grangegorman, Dublin.
12	Kingston-on-Thames—Dust Destructor Buildings	St. Pancras Borough Council	Borough Surveyor, Clatterton House, Kingston-on-Thames.
12	London, N.W.—Power Station and Sub-Station		Electricity Department Offices, 57 Pratz Street, N.W.
12	Newton, St. Cyres, Devon—House	Lancashire County Council	Ellis, Son & Bowden, Surveyors, Bedford Chambers, Exeter.
12	Preston, Lancs.—Widening Bridges	Corporation	County Bridgemaster, Preston.
12	West Ham—Transformer Chambers	Deftford Borough Council	Borough Engineer, Town Hall, West Ham.
12	London, S.E.—Bricks, Cement, Lime, &c.	Phillips & Marriott, Ltd.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deftford.
12	Coventry—Rebuilding Inn	Corporation	H. W. Chataway, Architect, Trinity Churchyard, Coventry.
12	Skewen, Wales—Rebuilding Inn and Five Houses	Corporation	J. C. Rees, Architect, Neath.
12	Middlesbrough—Cement, Bricks, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
12	Jarrow—Municipal Buildings	Corporation	F. Rennoldson, 37 King Street, South Shields.
12	Skewen—Inn and Five Houses	E. E. Bevan	J. C. Rees, Architect, Neath.
12	Blaengarw—Chapel	English Calvinistic Methodists	Mr. Hargest, Strand, Blaengarw.
12	Brentwood—Twenty-nine Workmen's Cottages	Urban District Council	Surveyor, Town Hall, Brentwood.
12	Halifax—Theatre	Corporation	R. Horsfall & Son, 22A Commercial Street, Halifax.
12	Coventry—Removable Floor to Baths	Admiralty	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
12	London, S.W.—Carpenter's and Joiner's Work.	Guardians	Director of Navy Contracts, Admiralty, S.W.
12	Birmingham—Workhouse Block		W. H. Ward, Architect, Paradise Street, Birmingham.
12	Huddersfield—Clothing Establishment		J. Kirk & Sons, Architects, Huddersfield.
12	London, S.E.—Lunatic Wards at Workhouse	St. Olave's Union Guardians	Newman & Newman, 31 Tooley Street, S.E.
12	Tir Phil, Wales—Five Shops	Borough Council	P. V. Jones, Architect, Hengoed.
12	Greenwich—Alterations and Repairs to Lecture Hall	London County Council	F. S. Robinson, Town Clerk, Town Hall, Greenwich Rd, Greenwich.
12	Horley, Surrey—Gatehouse, Lodge and Four Cottages	Stretford Urban District Council	Architect's Department, General Section, Spring Gardens, W.
12	Old Trafford, Manchester—Public Baths		E. Woodhouse, 88 Mosley Street, Manchester.
12	Dunleer, Ireland—Temperance Hall	Highland Railway Company	J. F. McGahon, Architect, Dundalk.
12	Shotton Colliery, Durham—Colliery Houses	Corporation	Horden Collieries, Ltd., Shotton Colliery, Castle Eden, R.S.O.
12	Wick and Lybster—Station Offices, Houses, Sheds, &c.	Corporation	W. Roberts, Company's Engineer-in-Chief, Inverness.
12	Chesterham—Park Chalet	Ynysybwl Urban District Council	Borough Surveyor, Municipal Offices, Oneltenham.
12	Ynysybwl, Wales—Workmen's Institute	Trinity House	J. Rees, Architect, Penre.
12	Lanner, near Redruth—Sunday School	School Board	H. W. Collins, Architect, Walreddon, Redruth.
12	Beverley—Extension of Lunatic Asylum	Walthamstow School Board	O. H. Hebblethwaite, 10 Waterhouse Street, Halifax.
12	Leeds—Baths and Library	School Board	H. A. Chapman, Architect, Prudential Buildings, Park Row, Leeds.
12	Portmadoc, Wales—Alterations, &c., to Market Hall.	Essex County Lunatic Asylum	A. Thomas, Surveyor, Council Office, Portmadoc.
12	Whitby, Yorks—Dwelling, Fog Signal House, &c.		Corderoy, Selby & Corderoy, 21 Queen Anne's Gate, Westminster.
12	Charmister—House for Private Patients at Asylum.		G. T. Hine, 35 Parliament Street, S.W.
12	Lowestoft—Schools		R. Beattie-Nicholson, 115 High Street, Lowestoft.
12	Higbam—Classrooms and Cloakrooms		H. Prosser, Architect, Sch. Bd. Offices, High Street, Walthamstow.
12	Cannock—Alterations, &c., to Schools		Bailey & McDonnell, Architects, Bridge Street, Walsall.
12	Chemsford—Underpinning Asylum Chapel		F. Whitmore, 17 Duke Street, Chemsford.
12	Castlebar—Extensions to Asylum		J. T. Kelly, Clerk, Lunatic Asylum, Castlebar.
June 14			
ENGINEERING:			
May 8	Llangattock, near Crickhowell—Waterworks	Rural District Council	T. Rees, Corn Exchange Chambers, Newport, Mon.
8	Bury—Ironway Cables	Corporation	Lacey, Clirehugh & Sillar, 78 King Street, Manchester.
8	Swansea—Hydraulic Cranes	Harbour Trustees	A. O. Schenk, Engineer, Harbour Offices, Swansea.
8	Knottley, Yorks—Concrete Work at Sewerage Wks.	Urban District Council	J. Richardson, 10 East Parade, Leeds.
8	Edinburgh—Waterworks	Edinburgh Board of Lunacy	Buchanan & Bennett, 12 Hill Street, Edinburgh.
8	Stapleford, near Hertford—Rebuilding Bridge	Hertford Rural District Council	J. Farley, Surveyor, Old Cross, Hertford.
8	West Malling—Boilers, Steam Mains, Laundry Plant.	Union Guardians	W. L. Grant, Architect, Sittingbourne.
8	Farrington—Water Supply Works	Rural District Council	G. Winslip, Engineer, Borough Buildings, Abingdon.
8	Belfast—Electric Light Installation	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
8	Dewsbury—Switchboard	Corporation	R. H. Ompion, Borough Electrical Eng'g., Bradford Rd., Dwsbry.
8	West Ham—Eight Transformer Chambers	Borough Council	Borough Engineer, Town Hall, West Ham.
8	Drogheda, Ireland—Reservoir, &c.	Gas and Water Committee	L. Donegan, Secretary, Gas and Water Offices, Drogheda.
8	Dublin—Subway	Lighting Committee	S. Harty, City Engineer, City Hall, Dublin.
8	West Ham—Machinery	Town Council	J. K. Beck, Borough Electrical Engineer, Abbey Mills, West Ham.
8	London, N.W.—Hot-Water Supply and Heating and Laundry Apparatus.	Willesden District Council	O. C. Hobson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
8	Leigh, Atherton and Hindley—Widening Bridges	Lancaster County Council	W. O. Hall, County Bridgemaster, County Offices, Preston.
8	Hull—Bridge Abutments, Retaining Walls, &c.	North-eastern Railway Co.	T. M. Newell, Engineer, Dock Office, Hull.
8	London, S.W.—River Wall	Fulham Borough Council	F. Wood, Engineer, Town Hall, Fulham.
8	Egremont, Cheshire—Gas and Electric Stores	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
8	Lydney, Glos—Pumping Plant	Rural District Council	J. F. Trew, Engineer, County Chambers, Station Rd., Gloucester.
8	Old Trafford, Manchester—General Engineering, Boilers, &c., at Baths.	Stretford Urban District Council	E. Woodhouse, 88 Mosley Street, Manchester.
8	Wedmore, Weston-Super-Mare—Bridge	Somersetshire Drainage Comm'iss'ners	W. Lunn, Engineer, Commissioners' Office, Queen St., Bridgewater.
8	Exeter—Septic Tanks, Filters, &c.	Town Council	City Surveyor, Exeter.
8	Rhyl—Waterworks	Urban District Council	L. G. Hall, Engineer, Paradise Street, Rhyl.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
May 21	Darlington—Gasholder	Corporation	Gas Engineer, Gasworks, Darlington.
" 21	Leeds—Cast-iron Water Cistern at Gasworks	Corporation	R. H. Townsley, General Manager, Gas Offices, Leeds.
" 31	Southampton—Dredging	Harbour Board	W. Bowyer, Clerk, Town Quay, Southampton.
June 2	Alexandria, Egypt—Beacon Buoys, &c.	Ports and Lighthouses Administration ..	Controller-General, Ports and Lighthouses, Alexandria.
" 2	Swansea—Refuse-destroyer	Administration of Ports and Lighthouses	G. Bell, Borough Surveyor, Guildhall, Swansea.
" 2	Alexandria, Egypt—Gas Beacons, &c.	Corporation	Office of Ports and Lighthouses Administration, Alexandria.
" 11	Calcutta—Sand Washers	Corporation	Engineer, Municipal Office, Calcutta.
" 12	Harrogate—Light Railway	Corporation	E. W. Dixon, 14 Albert Street, Harrogate.
" 16	Newport, Mon.—Transporter Bridge	Corporation	Borough Engineer, Town Hall, Newport.
" 30	Sydney, N.S.W.—Bridge across Harbour	War Office	Under-Secretary for Public Works, Sydney.
" 31	London, S.W.—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.
IRON AND STEEL:			
May 8	Grays, Essex—Railway Metals	Urban District Council	A. C. James, Surveyor to Council, High Street, Grays.
" 13	London S.E.—Ironmongery, &c.	Deptford Borough Council	V. Orchard 20 Tanner's Hill, Deptford.
" 14	Bradford—Cast-iron Gulleys, Ventilators, Grates, &c.	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
" 14	Middlesbrough—Lamp-Post, Iron and Steel, Pipes, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
" 15	Rochester—Cast-iron Socket Pipes, &c.	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
" 16	Leeds—Cast-iron Pipes	Corporation	City Engineer, Leeds.
" 16	Egremont, Cheshire—Iron and Steel, Lamp Columns.	Wallasey Urban District Council ..	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 19	Pontypridd—Cast-iron Mains	Urban District Council	E. Jones, Gas Engineer, Treforest.
PAINTING AND PLUMBING:			
May 10	Glass Houghton—Cleaning, Whitewashing, &c., School	School Board	V. Hulme, Clerk, County Chambers, Bradley Street, Castleford.
" 12	Killough, Ireland—Painting, &c., Houses	Charles Shells's Institution	G. M. Swail, Superintendent, Killough.
" 12	London, E.—Painting, &c., Libraries	Poplar Libraries Committee	Borough Surveyor, High Street, Poplar.
" 13	Croydon—White Lead, Oils, Colours, &c.	School Board	B. Rule, Clerk, Offices, Catherine Street, Croydon.
" 13	Leeds—Painting Fountain, Shelter, Greenhouses, &c.	Corporation	City Engineer, Leeds.
" 14	Greenwich—Cleaning Down & Painting at Convenience	Borough Council	Borough Engineer, Town Hall, Greenwich Road, Greenwich, S.E.
" 14	Middlesbrough—Oils, Paints, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
" 15	Egremont, Cheshire—Oils and Paints	Wallasey Urban District Council ..	J. H. Crowther, Engineer, Great Float, near Birkenhead.
ROADS AND CARTAGE:			
May 8	London, N.—Reconstructing Roadway	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 8	Abercynon, Wales—Road Works	County Council	W. Dowdeswell, Architect, Torharris.
" 9	Monmouthshire—Hauling Stone for Road	Corporation	W. Tanner, County Surveyor, Council Offices, Newport, Mon.
" 9	Preston—Levelling, &c.	Urban District Council	Borough Surveyor, Town Hall, Preston.
" 9	Walker, Northumberland—Reconstructing Road	Urban District Council	Clerk, Council Offices, Mechanics' Institute, Church St., Walker.
" 10	Raunds, Northants—Material	Argyll County Council	T. Yorke, Engineer, Raunds.
" 10	Oban, Scotland—Road Works, &c.	Urban District Council	K. Macrae, 5 Argyll Street, Oban.
" 10	Ilford—Making-up, &c.	Urban District Council	Surveyor, Town Hall, Ilford.
" 10	Goole—Carting, &c.	Urban District Council	M. Dunn, Engineer, Council's Office, Goole.
" 10	Church, Lancs—Materials	Urban District Council	W. E. Wood, Surveyor, Council Offices, Church.
" 10	Church, Lancs—Paving, &c.	Urban District Council	W. E. Wood, Surveyor, Council Offices, Church.
" 12	Broadstairs—Making-up Road	Urban District Council	H. Hurd, Town Surveyor, Council Office, Broadstairs.
" 12	Hale, Cheshire—Materials	Urban District Council	F. J. Lobley, Council's Surveyor, Ashley Road, Hale.
" 12	York—Private Street Works	Corporation	City Engineer, Guildhall, York.
" 13	Llanwrn, Wales—Improving Road	Magor Rural District Council	J. Thomas, Clerk, Union Offices, Queen's Hill, Newport.
" 13	Warminster—Flints and Team Labour	Rural District Council	R. H. Bourne, Surveyor, Crockerton, Warminster.
" 13	London, S.E.—Works and Materials	Deptford Borough Council	V. Orchard, 20 Tanner's Hill, Deptford.
" 13	Bootle—Private Improvement Works	Corporation	Borough Engineer, Bootle.
" 14	London, S.W.—Making-up and Paving	Fulham Borough Council	F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.
" 14	Gravesend—Quartzite	Town Council	C. E. Hatten, Town Clerk, Court House, Gravesend.
" 14	Middleton, Lancs—Paving, &c.	Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton.
" 14	Leeds—Tar Macadam	Corporation	City Engineer, Leeds.
" 15	Glasgow—Paving Work	Corporation	Office of Public Works, City Chambers, 64 Cochrane St., Glasgow.
" 15	Inverness—Road Repair, &c.	County Council	O. J. M. Mackintosh, District Road Surveyor, Fort William.
" 16	Middlesbrough—Road Materials, &c.	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
SANITARY:			
May 8	Derby—Sewerage Works	Corporation	J. Mansergh & Sons, 5 Victoria Street, Westminster.
" 9	Dudley—Nightsoil Removal	Town Council	H. O. Brettall, Town Clerk, Town Hall, Dudley.
" 12	Bingley, Yorks—Removal of Nightsoil	Urban District Council	Sanitary Inspector, Town Hall, Bingley.
" 12	Whitby—Sewerage Works	Rural District Council	Fairbank & Son, 13 Lendal, York.
" 13	Richmond—Lime, Sulphate of Alumina, Filter Cloth.	Main Sewerage Board	W. Fairley, Engineer, Kew Gardens.
" 13	London, S.E.—Disinfectants, Pipes, Sewer Works	Deptford Borough Council	V. Orchard, 20 Tanner's Hill, Deptford.
" 13	Richmond, Surrey—Lime, Sulphate of Alumina, &c.	Main Sewerage Board	W. Fairley, Engineer, Kew Gardens.
" 13	Carlisle—Drainage Works	School Board	J. Littler, Sanitary Engineer, Viaduct Chambers, Carlisle.
" 13	Gulval, Cornwall—Drainage Works	School Board	T. H. Cornish, Clerk, Parade Street, Penzance.
" 13	Mountain Ash, Wales—Sewerage Works	Urban District Council	Surveyor, Town Hall, Mountain Ash.
" 13	Bradford—Earthenware Pipes, &c.	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
" 14	Brightlingsea, Essex—Scavenging	Urban District Council	W. J. Osborn, Clerk, Foresters' Hall, Sydney Street, Brightlingsea.
" 14	Middlesbrough—Lime, Disinfectants, &c.	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
" 19	Penrith, Cumberland—Sewerage Works	Rural District Council	J. Graham, Engineer, Bank Chambers, Bank Street, Carlisle.

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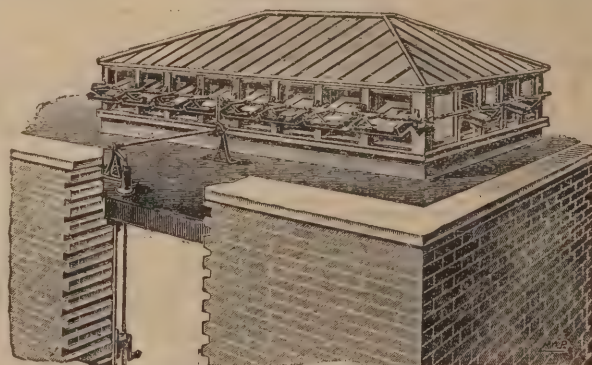
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COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
TIMBER:			
May 8	Hammersmith, W.—Re-laying Wood Floors ..	Fulham Parish Guardians ..	E. J. Mott, Clerk, Fulham Palace Road, Hammersmith, W.
" 12	London, N.W.—Fencing ..	Hendon Urban District Council ..	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
" 13	London, S.E.—Timber ..	Deptford Borough Council..	V. Orchard, 20 Tanner's Hull, Deptford.
" 14	Bradford—Timber ..	Corporation ..	J. H. Cox, City Surveyor, Towa Hill, Bradford.
June 9	London, W.C.—Firewood ..	London School Board ..	Contracts Sub-Depart., School Bd. Offices, Victoria Embankmt., W.O.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May 14	Harrogate—Town Hall ..	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
" 31	Sedgefield—Infectious Diseases Hospital ..	£10.	W. Snowdon, Surveyor, Council Office, Sedgefield.
June 1	Knaresborough—Infectious Disease Hospital ..	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 12	Crewe—Municipal Office and Council-Chamber ..	£50, £25.	Borough Surveyor, Municipal Offices, Crewe.
" 16	Hartshill, Stoke-on-Trent Nurses Home ..	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 21	Rhymney—Cottage Hospital ..	—	B. Jones, 29 Plantation Street, Rhymney.
" 27	West Hartlepool—School ..	£75, £35.	J. R. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings ..	£100, £50 £25.	Borough Engineer, Town Hall, Sunderland.
Sept 1-14	St. Petersburg—Bridges over Great Neva River ..	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg
No date.	Dublin—Market for Sale of Old Clothes, &c. ..	—	F. Sutton & Son, 52 Dame Street, Dublin.

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COMING EVENTS.

Wednesday, May 7.

BRITISH ARCHEOLOGICAL ASSOCIATION.—Annual Meeting at 4.30 p.m.

SURVEYORS' INSTITUTION.—Annual Dinner.

SOCIETY OF ARTS.—Mr. Albert Chancellor on "The Origin and History of Carriages" 8 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS INSTITUTION.—Ordinary Meeting at 8 p.m.

ROYAL ARCHEOLOGICAL INSTITUTE OF GREAT BRITAIN.—Meeting at Institution of Civil Engineers. First Day.

IRON AND STEEL INSTITUTE.—Annual Meeting at the Institution of Civil Engineers at 10.30 a.m. Election of Officers and Council. Presentation of the Bessemer Gold Medal for 1902 to His Excellency F. A. Krupp, of Essex. Report by the Committee appointed to investigate the Nomenclature of Metallography. Mr. Horace Allen on "A New Vacuum Tuiere for Blast Furnaces." Prof. J. O. Arnold and A. McWilliam on "The Microstructure of Hardened Steel."—Annual Dinner at 7 p.m. at the Hotel Cecil.

ANTHROPOLOGICAL INSTITUTE.—Prof. Boyd Dawkins on "Bigbury Camp and the Pilgrims Way." 4 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Meetings of General Purposes and Finance Committee at 4 p.m. Election Committee at 5.15 p.m., and Council at 7 p.m.

Thursday, May 8.

IRON AND STEEL INSTITUTE.—Annual Meeting at the Institution of Civil Engineers at 10.30 a.m. —Mr. J. H. Darby, Brymbo, on "The Compression of Fuel before Coking." Mr. James Douglas, L.L.D., on "Gas from Wood for use in the Manufacture of Steel." Mr. P. Byerman on "A Combined Blast-Furnace and Open-Hearth Process." Mr. W. J. Foster on "The Physical and Chemical properties of Carbon in the hearth of the Blast-Furnace." Baron H. von Jüptner, Donawitz, on "The Sulphur contents of Slags and other Metallurgical Products." Messrs. A. McWilliam and W. H. Hatfield on "The Elimination of Silicon in the Acid Open-Hearth Furnace." "Report on Research Work carried out during the past year," by Mr. J. A.

Mathews, Ph.D. Mr. H. Kilburn Scott on "The Iron Ore of Brazil." Mr. J. Thiry on "The Recovery of By-products in Coking." Mr. Axel Wahlberg, on "Brinell's researches on the influence of Chemical composition on the soundness of Steel Ingots."

ROYAL ARCHEOLOGICAL INSTITUTE OF GREAT BRITAIN.—Meeting at Institution of Civil Engineers. Second Day.

ROYAL INSTITUTION.—Dr. A. Smith Woodward on "Recent Geological Discoveries"—II. 3 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Discussion on "Form of Model General Conditions." 8 p.m.

Friday, May 9.

ARCHITECTURAL ASSOCIATION.—Mr. Owen Fleming, A.R.I.B.A., on "Artizans' Dwellings from the Municipal Point of View." Mr. Louis Ambler, F.R.I.B.A., on "Artizans' Dwellings from the Private Point of View." 7.30 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

Saturday, May 10.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to the Northern Wood Haskinsing Company's Works, Walker-on-Tyne, 3.30 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Visit to the Great Eastern Railway Works, Stratford. 9.30 a.m.

Monday, May 12.

SURVEYORS' INSTITUTION.—Ordinary Meeting at 8 p.m.

BRISTOL SOCIETY OF ARCHITECTS.—Prof. Beresford Pite on "Street Architecture." 8 p.m.

Tuesday, May 13.

GRESHAM COLLEGE.—Professor Wagstaff on "Elementary Statics"—I. 6 p.m.

Wednesday, May 14.

GRESHAM COLLEGE.—Professor Wagstaff on "Elementary Statics"—II. 6 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, May 15.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

GRESHAM COLLEGE.—Professor Wagstaff on "Elementary Statics"—III. 6 p.m.

ROYAL INSTITUTION.—Dr. A. Smith Woodward on "Recent Geological Discoveries"—III. 3 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Philip H. Newman on "Pageantry and Art."

Friday, May 16.

ROYAL INSTITUTION.—Sir Robert Ball on "The 'Nebular Theory.'" 9 p.m.

GRESHAM COLLEGE.—Professor Wagstaff on "Elementary Statics"—IV. 6 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Conversation at the Institution, Storey's Gate, Westminster, at 9 p.m.

Saturday, May 17.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Hamilton Palace, Mausoleum, Cadzow Castle, High Parks, &c., and Barncluth.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Visit to Cranham, North Ockenden and South Ockenden, in the neighbourhood of Upminster, Essex.

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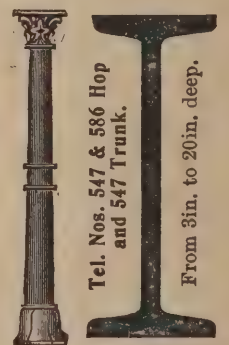
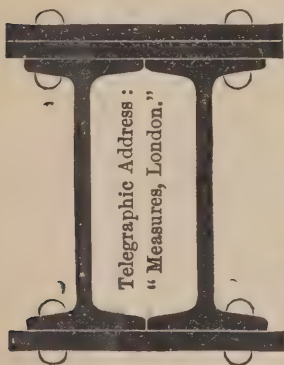
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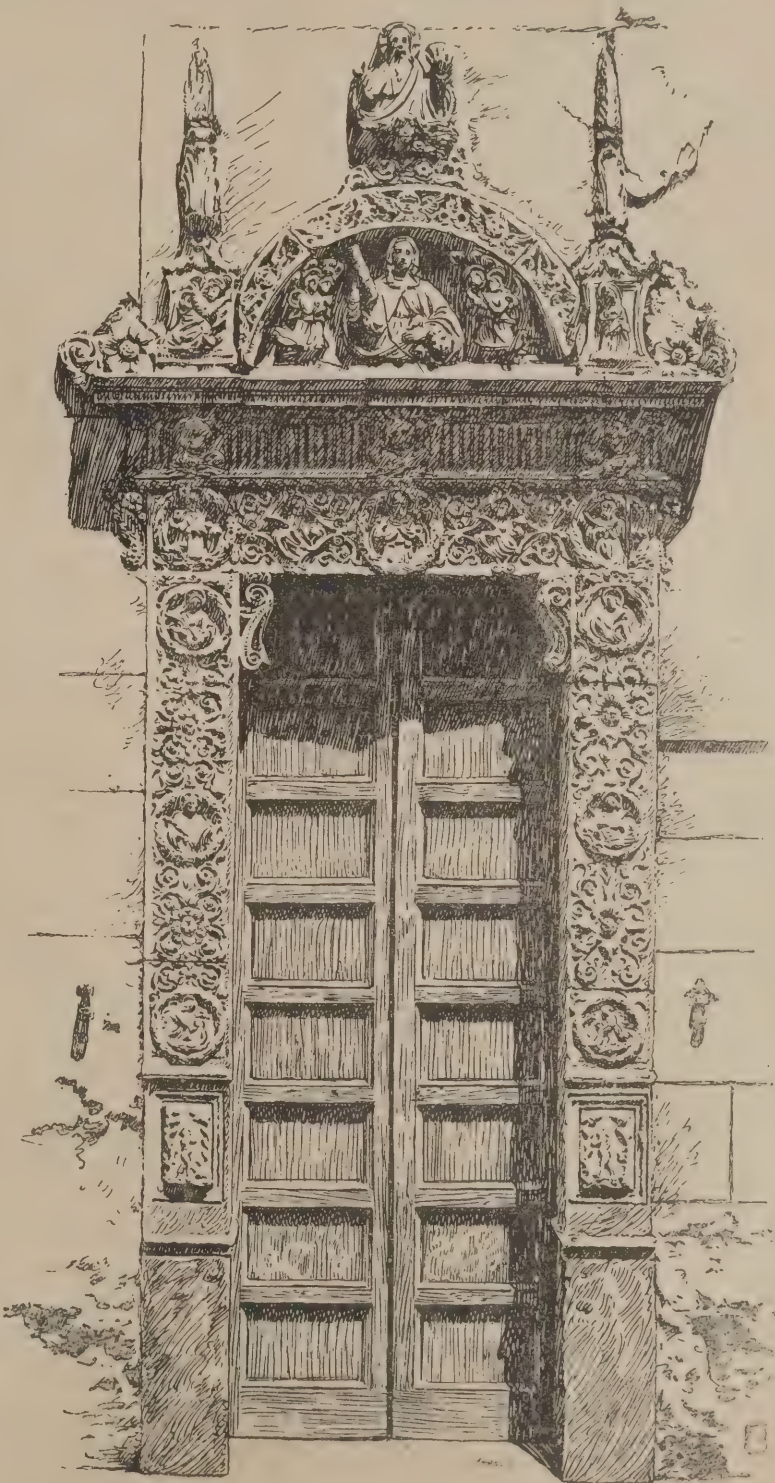
THERE is a Bill at present before the House of Commons for preventing the removal of monuments which have been erected in cathedrals or churches out of public moneys in pursuance of a vote of Parliament. It is backed by Sir Elliott Lees, Sir W. Anson, Mr. Butcher and Sir Robert Reid. When it is remembered how many monuments have been heedlessly taken away from ecclesiastical buildings, and in some cases replaced by very inferior work, the need for some such power as this Bill proposes is evident. If the measure becomes law it will not be permissible to take away or even to alter any such monument without Parliamentary consent. There is nothing, however, in the Bill to prevent the execution of "necessary repairs" to monuments, statues or memorials, or to the building in which they are contained; and it will consequently be necessary to keep a very close eye on those who have an enthusiasm for cleaning up—like our friends, for instance, at Chichester.

Mr. Potts's Roofs. AMONG his many stories, Max Adeler tells of the trouble Mr. Potts suffered in regard to his roof. Originally it was shingled, but as it leaked he had the shingles removed and a gravel-and-felt roof put on. But the very next night came a high wind which blew the gravel off so forcibly that it broke thirty-four panes of glass in the next-door house. The wind also tore up the felt and blew it over the edge, so that it hung over the front of the house like a curtain; and Mr. Potts lay wondering at the length of the night and did not get up till one o'clock in the afternoon. Then a tin roof was put on and it did well enough for a time. But whenever there was a heavy rain or the wind was high it used to rattle with a noise like the battle of Gettysburg. At last it began to leak and a man spent a week on the roof looking for the hole. He spread half a ton of solder over it, but when at last the snow came the water trickled down the wall and ran into an eight-hundred-dollar piano. Then

the tin roof was taken off and replaced by slates, but these used to get loose and slide down on the head of the girl hanging up the clothes; and to make matters worse the house became so frightfully damp that poor Mr. Potts and his family had to move to an hotel for a fortnight. He was then induced to try the "Patent Incombustible" roofing, but a week afterwards a fire broke out in his neighbour's stable which flung up a great many sparks. All the houses in the neighbourhood, however, escaped—except Mr. Potts's. His was in flames before the stable had finished burning; and when the firemen had put it out they got to fighting on the front stairs, with the result that the balusters were broken to pieces and a tin stream was played in the parlour for fifteen minutes. At present Mr. Potts's house is covered with the "Impervious Cement Roof," and it does well enough, except that it isn't impervious. It lets in water at eight different places, and whenever there is a shower Mr. Potts has to rush his family out on the roof to shelter it with umbrellas.

A German
Competition.

IN this year's Academy there is a design by Mr. Baillie Scott for a house in Germany, and also a coloured drawing of the dining-room, which embraces an elaborate scheme of decoration. It is interesting to note that these form part of a series which gained the first prize in a competition assessed by a jury of German architects. Some of the leading men on the Continent sent in designs and it is particularly gratifying that one of our own nationality should have won the competition. The whole series of drawings has been reproduced in colour by a German publisher, and it is proposed also to issue an English edition. As international competitions are so rarely held, there are many architects in this country who would doubtless be interested to see the successful designs, and we trust that the English edition may be successfully introduced. German architects might well take a leaf out of our own note-books so far as country houses are concerned, for no more shapeless, ostentatious and ridiculous designs could be found than those which are now produced in Germany.



SIDE DOOR, S. AGOSTINO, PALERMO.

SICILY AND ITS ARCHITECTURAL MONUMENTS.—VII.

By F. HAMILTON JACKSON, R.B.A.

(Continued from p. 155, No. 376.)

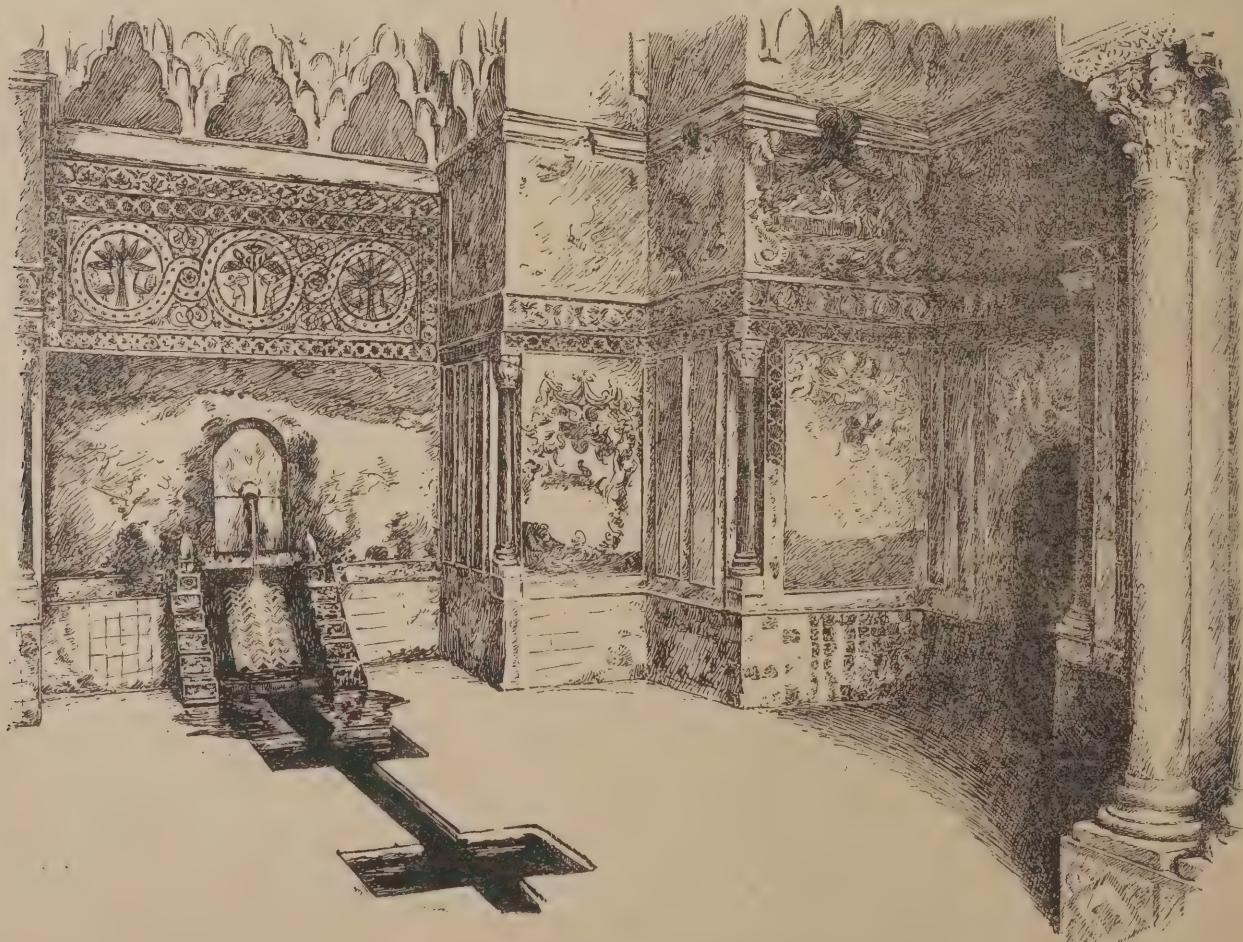
THE city of Palermo is divided into quarters by the Via Macqueda and the Corsi, Vittorio Emanuele, the ancient Cassaro. They intersect at a piazza called the Quattro Cauti, the corners of which are decorated with seventeenth-century sculpture. Quite close to this, in the Piazza Pretoria, is a monumental fountain made by the Florentines Michelangelo Vogherizzo and Francesco Camilliani in or about 1550, who set to work intending to surpass the fountain of Orione upon which Montorsoli was then engaged. It is of Carrara marble, and is nearly 400ft. round and 35ft. high. Fifty-six jets throw water from figures, monsters and heads in the frieze. It has quite a population of statues, some half and many full length, and cost 20,000 scudi. It was the gift of Don Pietro Garcia of Toledo, the viceroy. In the lower part of the city are several other interesting churches, such as S. Francesco, which has a fine but rather over-decorated Gothic rose window in the façade and eight Moorish columns in the doorway; a church in which the council of priors met until the Commune had a house of its own, and in the convent annexed to which sat the House of Deputies made by the Constitution of 1812. S. Agostino, above the Via Macqueda, has a similar façade, built in 1278, and also a side door of great beauty, made in 1506, the rich carving of which recalls the design of Spanish embroideries of the period. S. Antonio is another church of the same times, now much restored and modernized. The little church of S. Maria della Catena, so called because the chain with which the harbour was closed at night was attached there, dates from the end of the Aragonese dynasty, but stands on the site of an older church of the same name. It has a curious mixture of late Gothic and Renaissance forms which is not unpleasing. The columns of the nave arcade are Classic in intention; the quadripartite vaulting from the choir steps

eastward is raised and the walls above the transverse arches are pierced with Gothic traceried openings, the apse arches are pointed, while those of the nave arcade are segmental, mounted on stiltings, down which the mouldings return. S. Domenico is an enormous seventeenth-century church, capable of holding 12,000 people, and the Westminster Abbey of Palermo, where many distinguished men are buried. Below it is S. Cita, in which is some good Renaissance sculpture by the Gagini, and a little further on is SS. Annunziata, with a pretty Renaissance door bearing on it the emblems of its dedication. The entrance is, however, through the conservatoire of music, the ancient Palazzo Squarcialupo, through a fine early doorway decorated with Norman zigzags.

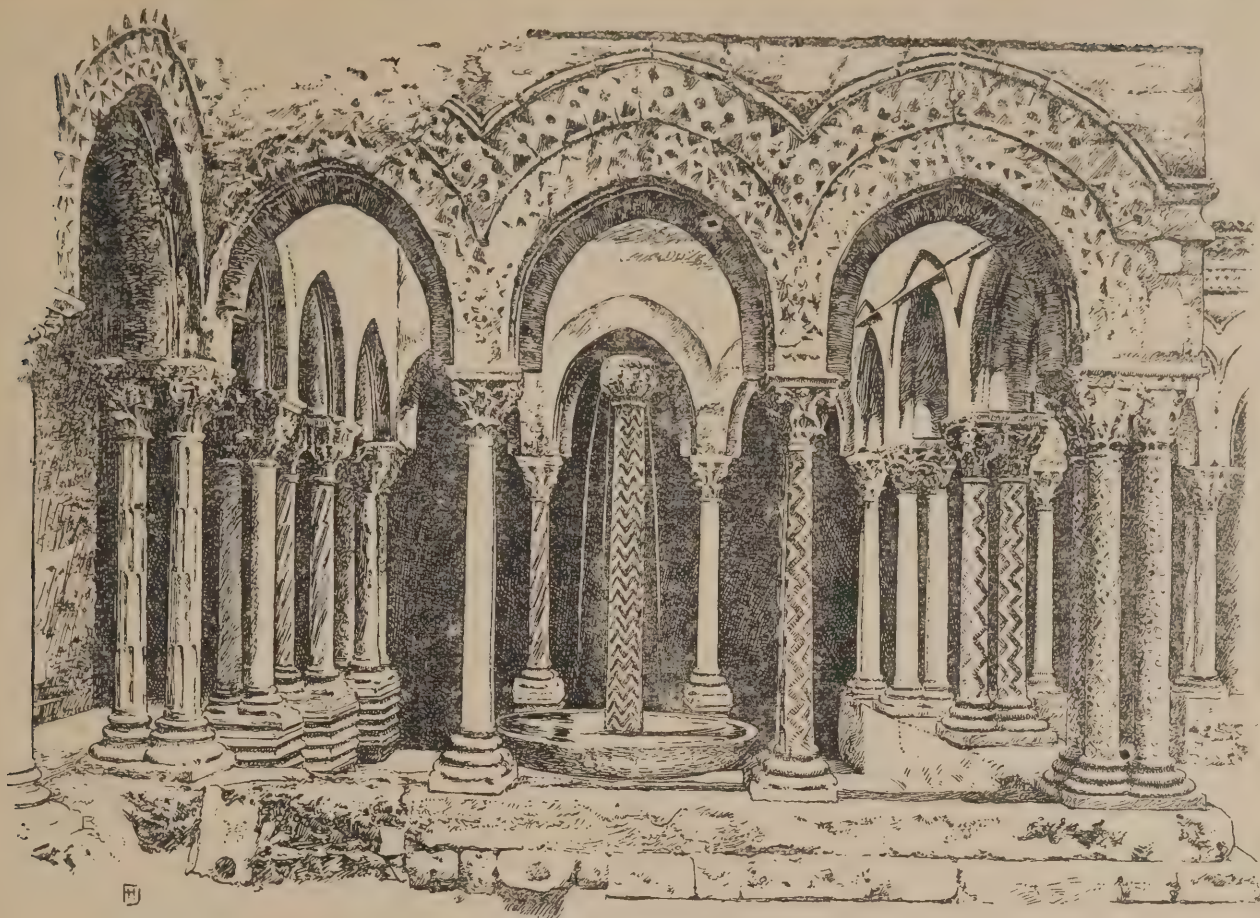
The Piazza Marina, which occupies the site of the ancient arsenal, still has near it a few ancient palaces. Of these the most important is the Palazzo Chiaramonte, called Lo Steri, commenced in 1307 by Manfred of Chiaramonte and completed in 1330. The great room has a fine wooden ceiling, panelled and painted with coats-of-arms, hunting scenes, battles and grotesques. In 1392 the house became extinct through the ill-judged ambition of Andrea Chiaramonte, who, being vicar of the kingdom, thought to make himself king. He was beheaded in front of his own house, and, his property being confiscated, the palace became the residence of kings and royal princes. Here in Charles the Fifth's time a parliament met, and hither in the seventeenth century the Inquisition was transferred from the Palazzo Bologni, the last *auto-da-fé* taking place in the piazza in 1723. It is now the tribunal of the court of assize. Behind, in the direction of La Kalsa, was the most conspicuous part of Mussulman Palermo, and many private mosques were built near to each other, "ten facing each other with a street between in the space of a bow-shot," as Ibn Haucal relates. Here is the fine late Gothic Palazzo Abatelli, a convent since 1596, and the church of La Gancia, whose monks showed themselves so patriotic in 1860; and a little further on, in S. Maria della Vittoria, is a part of the gate by which Count Roger entered Palermo.

Other interesting palaces are the Palazzo

Selafani, near the Piazza Vittoria, built in 1330 and finished in a year, as the story goes, in rivalry with the Chiaramonte, used as a hospital from the fifteenth century onwards, and now a caserne—it has an interesting early fresco of the Triumph of Death; the Palazzo Raffadalli, which has a Gothic screen wall, and is built on part of the ancient wall of Palermo; and the Palazzo Ajutamicristo, built at the end of the fifteenth century. This last shows Spanish influence in its design. The Museo Nazionale, housed in the suppressed monastery of the Filippini, contains a very mixed collection, comprising objects of the greatest interest, chief among which are the celebrated metopes from the temples of Selinunt, discovered by the English architects Angell and Evans. These comprise three extremely archaic panels representing Hercules Melampygos with the Cercopes, Persus beheading Medusa, and a quadriga, perhaps the contest of Pelops against Enomaus, two fragments of metopes of a rather later date, and four more in which the art of sculpture had nearly reached its full development. In these, though the greater part is carved in yellow tufa, the flesh of the female figures is inlaid in marble. The subjects are Hercules slaying Hippolyta, Zeus and Hera, Actæon and Diana, and Athene slaying Enceladus. Other architectural fragments are in the same room, which also show traces of stucco and colour. Many other antiques are in different rooms, of very various degrees of merit, and one large hall contains the mosaic pavements found in 1869 in the Piazza della Vittoria. Among the bronzes is a very fine colossal ram, said to have been at Syracuse since the eleventh century. Vases both antique and of the Arab period, coins, vestments, portions of painted Arab roofs, metal work and a large number of uninteresting pictures, among which, however, are two or three gems, make up the collection. These gems are a small triptych, probably by Mabuse, a fine portrait by Holbein, and one or two good pictures doubtfully ascribed to great names. The courtyards are very picturesque, the green of tropical vegetation contrasting with the carved stone of the architectural fragments, and the marble figures preserved here very pleasantly. The port is



HALL OF LA ZISA, PALERMO. DRAWN BY F. HAMILTON JACKSON, R.B.A.



FOUNTAIN IN CLOISTER, MONREALE. DRAWN BY F. HAMILTON JACKSON, R.P.A.

picturesque with shipping, and defended on the further side by Fort Castellamare, above which rises the mass of Monte Pellegrino, while beyond the Porta Felice at the bottom of the Cassaro is a fine promenade by the sea leading to the Villa Giulia and the adjacent Botanic Gardens, filled with flowers and shady trees.

Outside the city the principal objects of interest are Monreale, the various palaces of the Norman kings, and Santo Spirito, where the Sicilian Vespers began. An electric tram runs to Monreale through the Porta Nuova and lands the traveller in the piazza just outside the cathedral. The graceful Renaissance portico on this side of the church, beneath which is the bronze door made by Barisano of Trani, was put up by Archbishop Alessandro Farnese in 1569. The great west door was made by Bonanno of Pisa in 1186, but the knocker is Sicilian work. Both are quaint and curious bits of bronze casting, with finely carved and inlaid door posts. In front of the latter is a fine wrought railing, rather Spanish in design. The external decoration of the apses still remains, intersecting arcades and rosettes of dark stone, with pointed arches of a flatter curve beneath: the inequality of the two curved forms produces rather a curious effect. The plan is a Latin cross and the nave arcade consists of nine columns of oriental granite on one side and eight, with one of cipollino, on the other. The nave is three times the width of the aisles and the *solea* is raised by five steps. The caps are Roman in style, some Corinthian, some composite. The sanctuary is divided into three; the central part communicates with the sides by smaller arches resting upon twin granite columns. The high altar is beneath the triumphal arch, raised on eight steps, and on each side against the pier is a throne, one for the king and one for the archbishop, with fine inlaid marble backs to them, and pierced parapets of elaborate design at the side of seats and steps. Above the royal throne is a mosaic showing King William receiving the crown from Christ; above the other he is shown offering the cathedral to the Virgin. The arches are all pointed and stilted, and the walls are sheathed with marble in the lower part and covered with mosaics above. At the back of the apse is the ancient seat of white

marble in which the first bishops held their tribunal. The subject of the mosaics, of which there are over 70,000 sq. ft., is the triumph of Christianity, in prophecy, in fulfilment, and in the majesty of the Church founded by Christ. The walls of the great cross and of the nave bear subjects from Old Testament history and the principal events in the life of Christ, while on the *solea* and the sanctuary are subjects from the Acts of the Apostles and figures of angels, prophets, patriarchs, and saints of every kind, magnifying the triumphs of the orthodox Church. The colossal half-figure of Christ in the central semi-dome has written on the open book, in Greek and Latin, "I am the light of the world, who follows me does not walk in darkness." In the right transept are the tombs of William the Second, the founder, and of his father, William the First. The latter is of porphyry like the tombs of the kings in Palermo Cathedral, and had, like them, a canopy supported on columns. This, however, was broken when the fire occurred in 1811, which destroyed nearly the whole roof. The sarcophagus of William the Second was made in 1575, at the expense of Ludovico Torres, then archbishop; his tomb till then had been only of brick and plaster. Other members of his family who were buried here were his brothers, Roger, Duke of Apulia, who died in 1160, and Henry, Prince of Capua, who died in 1170, and his mother, Margaret, who died in 1183. In the north transept is a sarcophagus containing the viscera of S. Louis, whose body rested here for some time before being carried to France. The roof is of wood, painted and gilded, but the two side apses are vaulted. The mosaics in them represent Christ in the centre and cherubims in the corners. There are cracks in the wall of the northern one. Close to William the Second's tomb is a double ring of sacring bells, with twenty-eight bells in the outer ring and twelve in the inner.

The Benedictine monks brought by William the Second at the foundation of the monastery came from La Cava. The cloisters are on the south side of the cathedral, and are worthy of their reputation as some of the most beautiful in existence. The central area is laid out with palms, aloes and yuccas upon a ground of a large

sedum, relieving the warm grey of the arcade inlaid with lava, and the brilliancy of the couplel columns of weathered marble, many of them inlaid with mosaic. The capitals are carved very beautifully, and are perhaps better than any of the period on the mainland. One is signed by the sculptor "Ego Romanus filius Constantinus marmorarius," with date "A 1228." In one corner is the beautiful lavabo, a zigzagged column with a crowning feature consisting of heads and scrolls, from which the water falls in small jets into a basin, surrounded by a similar arcade. When the coupled columns reach an angle they are doubled, and the four are carved with beautiful arabesques, which give a further charm to the cloister. A curious feature of the arches is the large round inner moulding, which is not supported at all by the caps, and gives an aspect of incompleteness to the arcade. Under each cap is a plate of lead. A similar expedient was adopted by the Moors at Granada. Above the southern arcade rises the wall of the dormitory above the refectory, now only an arcaded screen wall with alternate shafted windows and similar panels without columns. From a terrace beyond a fine view up the valley may be had, and from the piazza one looks across the Conca d'Oro and past Palermo to the sea. The most conspicuous building in the city is neither royal palace nor cathedral, but a huge modern theatre of ungraceful outline.

One of the palaces of the Norman kings may be visited on the way back from Monreale by making a detour to Altarello di Baida. It is supposed to have been the one called Mimnermum. The remains are very much like those of La Zisa, but coarser in workmanship. An inscription over the door of the chapel records its restoration in 1493 by the Archbishop of Palermo. The arches of the side niches are horseshoe in shape, a Moorish detail not met with elsewhere in Sicily. From this place a cross road conducts to La Zisa, a palace built by William the First which still exists, though in a very squalid state. It once stood in the midst of a spacious garden full of fruit-trees and watered by perpetual springs. It now faces on to a dull piazza, and nothing remains of the garden but one stone-pine at the side. Battlements surmount the wall upon which an Arabic inscrip-

tion run, much defaced. The wall is panelled with a pointed arched arcade, and from the ground floor the hall is entered by three pointed arches which gave access to a corridor—the centre one has been lowered, apparently in Spanish times, when also the closing grille was probably made. The entrance arches are flanked by two columns on each side, and at each projecting angle of the Greek cross which forms the plan of the hall a colonnette is inserted. There are three deep alcoves vaulted with stalactite vaulting; the one facing the door is occupied by a fountain with mixed Arab and Norman details. The lower part of the walls is covered with blue Spanish tiles and the wall-panels have been of veined marble with borders of marble mosaic, but the walls have been daubed over with seventeenth-century frescoes to the great detriment of the effect. Above the fountain is a mosaic panel of three circles, two of which are filled by trees with peacocks by them, while in the centre are two archers instead; above it is a frieze of the same material, which is carried all round the room on a lower level. The water runs across the marble pavement in a sunk channel with two square basins, which become octagonal below the surface of the water. Behind the palace is a wretched fountain of the period of the Spanish restoration. Nearer to the Porta Nuova is La Cuba, one of William the Second's palaces, now a cavalry barracks. The outside has the usual pointed arcading. The lower storey is vaulted with a flat arched vault and on the first floor is a little courtyard with a niche in it filled towards the top with interlacing patterns and arabesques between. Close by is the office of the head saddler "Capo Sellaio." A pavilion belonging to this palace is known by the name of "La Cubola." It stands in an orange garden half a mile nearer Monreale, and consists of a dome like those of S. Cataldo with four pointed arches below. It probably had a fountain within it and is thought to have been the scene of one of Boccaccio's stories. The remaining palace was King Roger's and its site was at the foot of Monte Grifone, on the south-east of Palermo. It was called "La Favara," or "Maredolce," and still preserves its exterior walls of squared stone, a fine calcareous tufa, with the usual long-pointed arched arcade characteristic of the period. In the interior are some ruined vaults and a few rooms which still preserve their roofs, and at the eastern angle a chapel remains which is Norman in style, with a cupola surrounded by a singular stone cornice and a little tower above it, while outside the building to the north are some remains of baths. This was King Roger's favourite retreat, and in his day the palace was on an island in the midst of a lake (whence the name Maredolce) which was planted with oranges and lemons. Two high palm trees were landmarks in his time and suggest a greater antiquity for the palace. Nine canals full of fish and lined with trees cut the park in every direction, which then extended to the sea.

The church of Santo Spirito is interesting as having been the place where the insurrection called the "Sicilian Vespers" broke out, but the twelfth-century church, which stands in the modern Campo Santo, has been so much restored as to look as new as the monuments which surround it. The Ponte dell'Ammiraglio, built over the Oreto by George of Antioch, looks much more venerable. The river no longer flows through it, having changed its channel, but the authorities have had the good sense to leave it as it was and construct a new road by the side of it. It has five pointed arches, and smaller ones in the piers between at a higher level to allow flood-water to pass, and is paved with cobble stones. It was here that Garibaldi and his thousand fought an engagement in 1860, before entering Palermo, on May 27th.

The most ancient gate still in use is the Porta S. Agata, through which the maddened people poured in 1282 to complete the vengeance begun at S. Spirito, but some remains of the ancient walls may be traced here and there, far within the present limits of the city. Behind a shop in the Piazza Nuova are the remains of the Porta Oscura, an arch and a piece of the wall; a small piece of the wall and a string course of Porta Rutah still remain, some portions of the Porta Patitelli and a part of the arch and the impost of the Porta Busuemi. This is close to the

palace of Count Frederick, near the Via de' Biscottari and Via Benfratelli—indeed, some Palermitan archaeologists maintain that this tower, which has one two-light window of the usual type with lava inlays, and a corbelling below with shields and coats-of-arms, was part of the defences of the city, and some think the lower part of it is Phœnician. The Porta Mazzara is, however, the most picturesque, having been restored in late mediæval times. This gate was closed in 1639 when the Porta di Montalto was opened.

(To be concluded.)

Views & Reviews.

An Old Sarcophagus.

Mr. Chalmers is a Scotch archaeologist of note as well as an eminent church architect, and this monograph on the very curious and interesting old sarcophagus at Govan is the fifth of his published works. There is not very much to tell about the sarcophagus. It was discovered in 1855 by the sexton while digging a grave, and is of white sandstone very roughly shaped and (at a later date) decorated on its four sides with very quaint carvings. Interlacing ornament of the kind we are accustomed to call Celtic occurs at each end and in the panels on either side, the remaining panels being filled with crude representations of beasts. One panel shows the four mystical beasts of the Apocalypse—"And the first beast was like a lion, and the second beast like a calf, and the third beast had a face as a man, and the fourth beast was like a flying eagle." The particular four beasts on the sarcophagus, however, are so much alike that one is as much amused at the ingenuity of the archaeologist as at the quaint carvings themselves. Mr. Chalmers comes to the conclusion that the sarcophagus was decorated in the twelfth century, when the cathedral of Glasgow was founded and the district placed under the settled jurisdiction of Bishop John. The book is illustrated by scale drawings by the author, and a rubbing of the figure of a man on horseback, as crude in execution as the others, but remarkably full of movement.

"The Govan Sarcophagus: The Shrine of S. Constantine," by P. Macgregor Chalmers, F.S.A. Scot. Glasgow: Carter & Pratt, 62, Bothwell Circus. Price 3s. 6d. net.

The Theory of Fine Art.

The second edition of Professor Baldwin Brown's book has just made its appearance. The first edition was published in 1891, and the present one has been much enlarged both in matter and illustrations. The book retains its original form of being divided into three parts—(1) Art as the expression of popular feelings and ideas; (2) the formal conditions of artistic expression; and (3) the arts of form. The author's chief point is the insistence on the principles of order as essential to artistic form.

The book consists of the usual expression of small thoughts in pompous language, with its phrases about the individual externalising himself in expression; and though logical, deductive reasoning is attempted throughout, it is mostly marred by looseness of thought and conclusions that are not warranted by the facts with which it is endeavoured to demonstrate them. One great fault is the attempt to draw too great a distinction between the various arts and between art and utility. After all art is utility, and if it were not it would be valueless. To define "art" too closely is absurd, because the term expresses such a wide field of effort. Though Professor Brown endeavours to explain art by its causes, he objects to the term evolution being applied to this view of art as functional expression. Of course "evolution" has been used in an unwarrantable manner, by persons with a smattering of science, to express the results and not the means. The author quotes Yrjö Hirn's statement that a work or performance which can be proved to serve any utilitarian non-aesthetic object must not be considered as a genuine work of art. "True art," he says, "has its own law in itself, and rejects every extraneous purpose." Here is another instance of a misconception of the true meaning of utility and a distortion of facts to press home a point.

Professor Brown goes on to speak of play and its bearing on art, enunciating the old

fallacies and expressing thoughts which are mere variants on those that have gone before, and more often than not are beside the mark; such as, "In other words art is given out rather from the depths of the nature of man than merely from its surface." Now if this is so, may we not doubt if the primal cause of beauty and art is not the same in both animate and inanimate nature? And are we right in assuming that "aesthetic feelings, like those of an ethical character, are the prerogative of man alone"? If art is "self-externalization" may it not be found in all products of energy? Order—under which is included rhythm, measure, proportion and composition, which is rightly insisted upon as so essential in artistic effort—is not apparent in the work of man only. And to differentiate between "the controlling force" and the "motor force" is mere juggling with words. The fact is that too great a point has always been made of art being different from other forms of activity. The principle of order is apparent and necessary in everything. Indeed it is so utilitarian a principle that a structure built to serve only useful ends, if built in the most logical manner, not only gives pleasure to the worker (and the artist we are always being told is he who takes a pleasure in his work), but is beautiful without any special endeavour having been made to obtain beauty. Professor Brown's view, however, is that architecture is the addition of artistic form and decoration to utilitarian structures. We thought that Leopold Eidlitz in his "Nature and Function of Art, more especially of Architecture" (which by the way is not mentioned by Professor Brown) had disproved this fallacy conclusively enough. To refer to "structures for show rather than for utility" is again beside the mark, for the "show" is their function or use. We are tired, too, of being referred to the practice of the Greeks for proof. There is no reason why we should go wrong if the Greeks did so. If there were no buildings in the world whatever, we could still draw up a working theory from animate and inanimate natural objects, for nature, whose beauty we cannot deny, is functional throughout. We may therefore conclude that, as we are part of nature, the product of our hands must be of the same nature throughout, namely, utilitarian throughout. All art is one and subject to the same rules. "Beauty and usefulness by no means necessarily co-exist," says Professor Brown, but if the thing is thoroughly utilitarian, in the best sense—that is, serves its purpose absolutely—we contend it must be beautiful. The wrong method of outlook has caused Professor Brown to deny the position of Viollet-le-Duc and others in calling for the truth always. "Truth," says Brown "in itself may be a moral, but is not necessarily an artistic virtue." When art then is a lie, it is worse than useless, but truth only "may be" a moral virtue. Again, beauty and significance are differentiated, but the former is contained in the latter.

Colour and curves are referred to as examples of formal beauty, but here also the underlying reason is their "utility," if we may call it so. Professor Brown thinks colour and ornament are not essential to architecture. But from the point of view that the distinctive colour of a material is caused by its molecular structure it is expressive of this and forms a very considerable element in architectural effect. Decoration too is necessary in many cases to express the idea intended to be conveyed. It is not to be expected that the various branches of industry can be separated by hard lines, as all use the same elements. Engineering, architecture, sculpture and painting often treat the same subjects, and to say this is architecture and that engineering, &c., is impossible. The artist with eye trained to traditional methods is quicker to appreciate illogical construction, but nevertheless the ultimate appeal must be in cases of dispute to the scientist, who, struggling up another road, arrives at the same point. This book, though warped in its judgment, as all partisan views are, serves a useful purpose however in renewing attention to a side of the question that has of late been somewhat pushed into the background by zealous supporters on the other side.

H. K. D.

"The Fine Arts: A Manual," by G. Baldwin Brown, M.A., Professor of Fine Art in the University of Edinburgh. Second Edition. London: John Murray, Albemarle Street. Price 6s. nett.

Bricks and Mortar.

APHORISM FOR THE WEEK.

The very design of dress, good breeding, outward ornaments, and ceremony, were to lift up human nature and set it off to an advantage. Architecture, painting, statuary, were invented with the same design; as indeed every art and science contribute to the embellishment of life.—ADDISON.

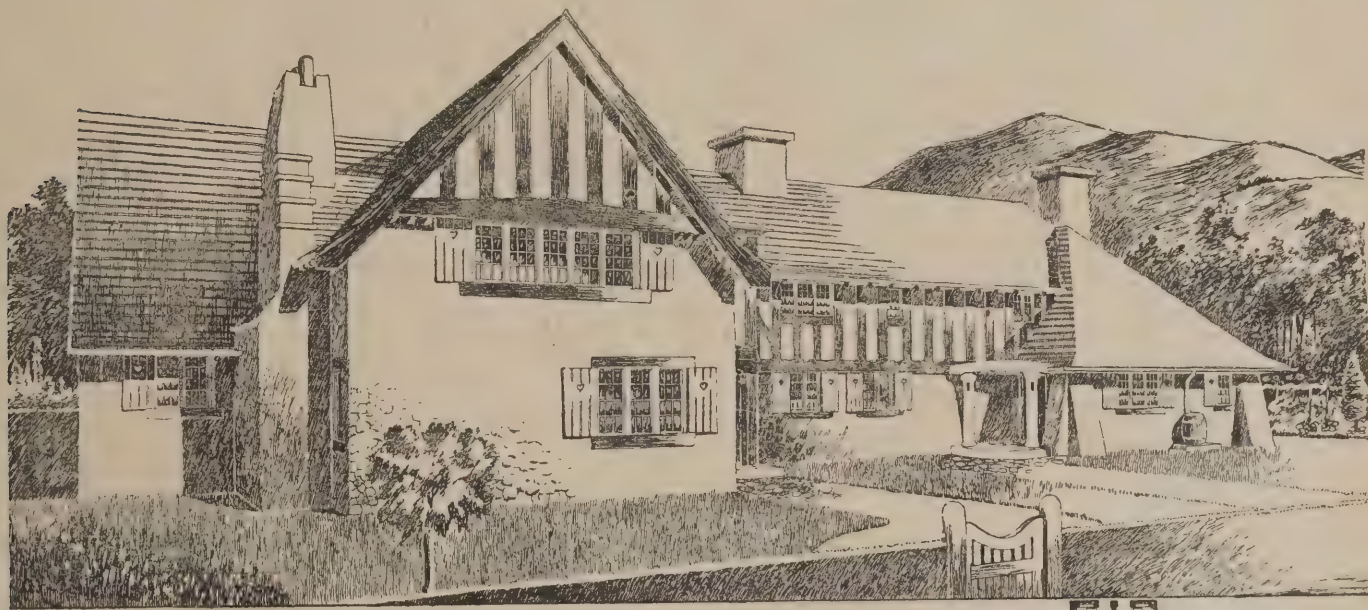
Our Plates. ALL SAINTS' MISSION CHURCH has lately been built at 90, White Lion Street, Pentonville. Under the church is a large gymnasium, and these buildings are only a portion of the scheme of the mission, which will ultimately have more club-rooms, a clergy house and dormitories added. The form of construction has been dictated by considerations of cheapness, strength and light. The stanchions in the gymnasium, supporting the floor of the church, are carried through the floor to a height of 9ft. in the church, and support the steel framework which carries the roof of the church. Between the steel framework L-iron wrought-ribbion work is introduced. The chancel screen, rood and ambone will all be in wrought-iron. The whole of the steel and iron

they will be converted into a shooting-box, and will form the residence of Mr. Simpson until the completion of the large house. The materials are the same as employed for the house, but it has latterly been decided to cover the walls with white rough-cast instead of revealing the stone. The outside oak work will be slightly fumigated. The stables will be built in connection with the house and cottages and will be in the same red sandstone, with red tiles to roof. The arch to the covered entrance way and copings to tower will be in Bath stone. The stable contains four stalls and loose-boxes, a large coach-house, a motor-car shed and other offices; a coachman's residence being provided in the tower. There will be an addition to the stables, which will form a fourth side to it, of an engine-house for the supply of electric light to the house, cottages, lodge, stables and drive, and a cable will be laid for supplying power to a small estate saw-mill, which is proposed to be erected in the valley. The whole of the buildings on this estate are being carried out by Messrs. E. Turner & Sons, of Cardiff.

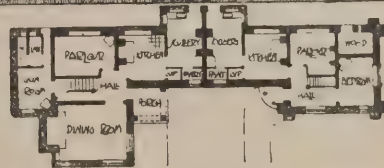
Housing. A CONFERENCE on housing reform was held recently in Newcastle-on-Tyne under the auspices of the northern section of the Co-operative Union, the

of the worst things that had happened in the counties of Northumberland and Durham was that among the miners the houses had not been built in a more attractive manner. The tendency of towns was to produce a second-rate type of men and women. The only remedy was to get the men and women away from the towns and put them in decent houses in healthy surroundings.

House and Garden THE following particulars of this design, which was illustrated in our centre plates last week, came to hand too late for publication in that issue:—Moonhill is near the charming Sussex village of Cuckfield, which is on the direct coach road from London to Brighton. Away to the south of Cuckfield are rolling downs, and on the highest point, called Moonhill, there existed an old farm-house to which additions were made a few years ago. The property has only lately come into the hands of Mr. Lloyd, who decided to further add to the old house a new dining-room, billiard-room, a large hall and additional kitchen offices. The old dining-room is converted into a library, the whole of the new work being designed to harmonize as far as practicable with the older portions of the house. From this it will be gathered that the accommodation for a small country residence is



TWO GAMEKEEPERS' COTTAGES AT WOLFESNEWTON, MONMOUTHSHIRE.
A. J. HARDWICK, ARCHITECT.



work is painted dead black, and the ribbon-work will eventually be gilt and painted with transparent colours. The floor of the chancel is laid in black and white marble. Messrs. Campbell Smith & Co. were the contractors, and Mr. R. A. Briggs, F.R.I.B.A., of 12, Norfolk Street, Strand, is the architect, from whose designs, and under whose superintendence, the work was carried out.—The house at Wolvesnewton, Monmouthshire, is to be erected for Mr. H. J. Simpson. Mr. A. Jessop Hardwick, of Eagle Chambers, King-ton-upon-Thames, is the architect. The materials proposed to be used are local red sandstone, quarried on the estate, with Bath-stone dressings. The roofs are to be covered with red tiles. The timber work and internal fittings are to be of oak. The water-tower, which would be supplied from a spring from the hills above, would be copper domed, and would be used for serving the fire hydrants, &c. The house contains a hall with open timber ceilings and gallery over, a large billiard-room, dining- and morning-rooms, with extensive offices. The gamekeepers' cottages, illustrated on this page, are in course of erection on the same range of hills as the house. For a time

National Housing Reform Council, and the Durham and Northumberland Land and Labour Committees. The mayor of Newcastle (Mr. H. W. Newton) presided, and explained the local endeavours which had been made to deal with the problem. Some years ago the Corporation prepared a scheme of single tenements at the east end, where people lived who were making from 16s. to 18s. a week. They wanted to provide these people with a room at a rent of from 2s. to 2s. 6d. a week, and proposed a scheme which provided a large room, partitioned off, with plenty of room for ventilation. But the Local Government Board objected to the scheme on the ground of public morality. The council now proposed to erect buildings of one and two rooms in the centre of the city, the rent being 2s. 6d. for one room and 4s. for two rooms. In seconding a resolution in favour of municipal garden cities and increased powers of purchase of land, Dean Kitchin said that the one question at the base of the matter was the abominable condition of the land laws of England. The real difficulty was to get the whole of the land in such a way as would enable them to make a proper use of it for the good of the people. One

very complete. The old farm buildings are being converted into stables and the barn into a recreation-room. The garden scheme, of which a small portion is shown in the perspective view, is entirely new, but such trees as previously existed on the site have been retained. A new drive is now being formed from a convenient point on the Brighton road; this enters the large carriage court on the west side of the house, a separate branch leading to the kitchen offices and vegetable garden. Ample accommodation has been provided for garden games, consisting of a full-sized croquet lawn, four tennis lawns and a good bowling green. At the end of the latter are erected two garden-houses, which are connected by a circular sweep of treillage fixed between brick piers. A long walk runs in an easterly direction and in line with the main terrace; this is bordered on either side by herbaceous borders backed by yew hedges. This walk is finished by a handsome gate, the line being continued for a considerable distance by a chestnut walk. To the south of the lily pond shown in the perspective view is arranged a rose walk, with festoons and arches on either side. Mr. P. Morley Herder, of 148, New Bond Street,

is the architect for the house; whilst Mr. T. H. Mawson, of Windermere, and 28, Conduit Street, W., is responsible for the garden.

The Apulian Aqueduct.

THE Bill for the construction of the Apulian aqueduct has been laid before the Italian Chamber. The enterprise to which it relates is one of the most extensive water-carrying schemes ever attempted in Italy. It is proposed to draw from the Sele, a river which rises in the Apennines, west of Potenza, and falls into the Gulf of Salerno, a supply of water equal to 4 cubic metres per second, and to carry it by means of a brick aqueduct for 100 miles eastward across Apulia, so as to provide water for drinking and irrigation purposes to the Provinces of Foggia, Bari and Lecce. The cost of the enterprise is estimated to be at least £8,000,000. It is to be constructed by private contractors, who after working it for ninety years will hand it over to a body representing the State and the administrations of the three provinces through which it is to pass. From July 1st, 1907, the State will contribute £160,000, and the three provinces together £40,000 a year, for not more than twenty-five years, to the cost of the undertaking. When the aqueduct is in working order one-half of all the nett profits above 5 per cent. will go to the State and to the provinces. The communes through which the aqueduct will pass will be obliged to pay a fixed annual rent for the water supplied. As soon as the Bill has been passed Italian and foreign contractors will be invited to tender for the concession, and will be exempted from the Italian stamp duty in respect of the capital they may employ. The construction of an Apulian aqueduct has long been desired, but has never before been brought

within sight of realisation. Some engineers believe that even now its realisation is far from certain, because they do not think that on the basis of the present Bill the enterprise can pay the contractors. It is now said that it will be necessary to find about £8,000,000 capital before beginning the aqueduct. The interest on this capital at 5 per cent. will amount to £400,000 a year, whereas the Government subsidy, including that from the provinces, will be only £200,000 a year for twenty-five years. It is not believed that the Apulian communes and landlords are rich enough to pay the difference.

Ranworth Road Screen.

THE finest painted rood screen in England is that of Ranworth, in Norfolk. It dates from the fifteenth century, and in addition to the superbly-executed figures of Saints and of the Heavenly Hierarchy, its mouldings and vaulting are enriched with most beautiful ornament. The paintings and gesso work—for much of the ornamentation is modelled in relief, and gilt or coloured—are in what one can only feel to be quite a providential state of preservation, considering the ruinous condition into which the church was allowed to fall by former generations. Fortunately the screen is, so far, unrestored. But with the roof and floor in the last stages of decay, the windows falling out, and the walls splitting asunder, there seemed little chance of securing for future ages this priceless relic of English Pre-Reformation art. Some little time ago, however, a strong committee was formed, and a vigorous attempt made not to restore the screen, but to repair the church itself to such an extent as to render it not only fitting for worship but sound enough to preserve the screen from further deterioration. Under the

advice of Mr. J. T. Micklethwaite, F.S.A., plans have been prepared for this purpose, and the estimated cost of carrying out the necessary works is £4,000. About £2,000 of this has been raised locally, and devoted to the reparation of the roof, exterior walls and windows. It is now felt that there ought to be sufficient national interest taken in this matter for the remainder of the sum needed to be raised elsewhere.

New Patents.

These patents are open to opposition until June 16th.

1901.—Scaffolding.—7,829. F. M. DAVID, "The Grange," Neasden, London, N.W. This invention relates to a double socket through which two scaffold poles are passed crosswise; while boards are supported by clips which abut against the poles. The device is specially adapted to interior scaffolding. Easy adjustment and self-securing are the main advantages claimed.

Artificial Stone Slabs.—7,872. J. FIELDING, "The Lawn," Brunswick Road, Gloucester. A hydraulic press is provided with three moulds carried on a rotating frame. In these the slabs are formed. They are then raised by a vacuum plate and mechanically lifted on to trolleys for conveyance to the drying room.

Water-Closets.—7,939. W. CASSELS, 9, Allan Park, Stirling. The closet consists of a glazed fireclay recess the upper part of which curves forward, the lower part being formed with an oval opening. By this arrangement it is claimed that the closet is made more sanitary.

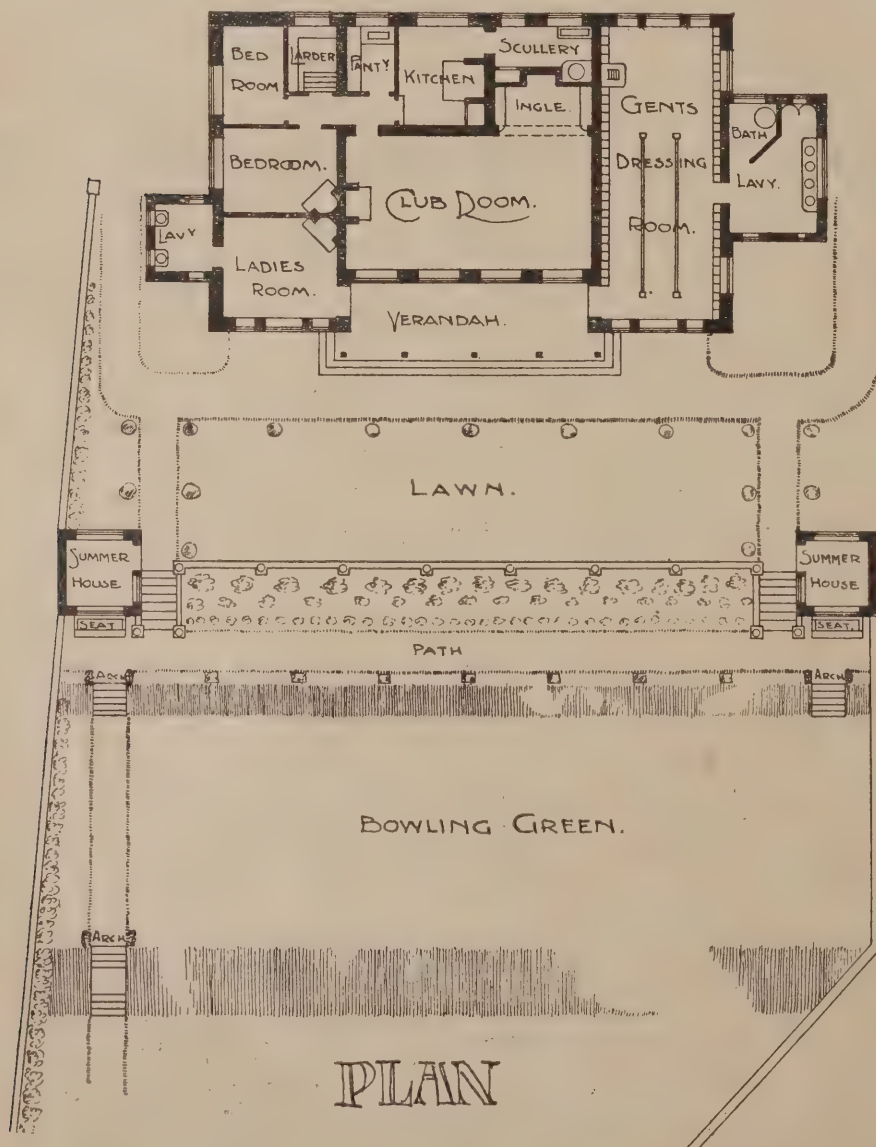
Partition Walls.—9,843. J. J. THOMPSON, Eversley, Weaverham, near Northwich. Wires are stretched from wall to wall and the partition is built up of brickwood or porous earthenware slabs having tongues and grooves, the wires fitting in the joints across each course.

The following specifications were published on Thursday last, and are open to opposition until June 23rd. A summary of the more important of them will be given next week. The name in italics is that of the communicator of the invention.

1901.—7,461, CHAMBERS, pulley block. 7,692, BUTRICK, combination measuring instrument. 8,432, DANIEL, self-locking and self-releasing sliding ladders. 9,019, BJÖRNSTAD, electric controlling gear for lifts or hoists. 9,131, SCHIMANDL, alarm attachments for the locks of doors, windows, &c. 9,200, HARRIS, guides for band saws. 10,341, EWART, independent hot-water radiator. 10,782, BARR & WILKINSON, discharging sewage on to bacteria beds, filters, or tanks for sewage. 13,015, MANKARZ, joiners' cramps. 16,373, SEYERS, down and ventilating pipes and brackets. 18,020, EVANS, hot-water heating apparatus. 20,822, WELLMAN, sash-locks. 22,779, METCALF & WOOD, fireplaces. 24,136, ALFRED WILLIAM MOORE, wood-block paving. 25,744, PLASTER & MILLER, combined door knobs and alarm bells. 25,838, COCHRAN, securing handles to door locks. 25,985, DUBY & SHINN, carpenters' tools for setting-out work.

1902.—1,548, OTIS ELEVATOR CO., LTD. (*Otis Elevator Co.*), lifts. 2,145, BOSCH, ventilating fan or screen. 3,210 VÖGT, elevator for deep wells. 3,588, WOOD, glazing bar. 4,358, ANDERSON & BORCHERS, combined brick and tile for walls, &c. 5,115, SCHMITT, tool for making holes in walls. 5,481, JOHNSON, fireplaces. 6,032, BREMER, fireproof ceilings or floors. 6,166, WÜSTEFELD, floors.

The Club-House at Ogden for the Halifax Golf Club, exhibited in this year's Academy exhibition and illustrated on p. 177 of our issue for last week, is erected on the site and chiefly from the materials of eight old cottages. The stone is the local sandstone roughly squared and coursed. The roof is covered with stone slabs known locally as grey slates. The garden slopes down to a trout stream which separates it from the home green. The contractors were:—Mason, Messrs. Smithies & Murgatroyd, Mount Tabor, Halifax; joiner, Messrs. F. Greenwood & Sons, Gibraltar, Halifax; s'ater and plasterer, Mr. N. Crabtree, Ogden, near Halifax; and plumber, Mr. Wilson Stocks, Queensbury, near Bradford. The architects were Messrs. Joseph F. Walsh & Graham Nicholas, of Museum Chambers, Halifax.



CLUB-HOUSE AT OGDEN FOR THE HALIFAX GOLF CLUB.
J. F. WALSH AND GRAHAM NICHOLAS, ARCHITECTS.

Surveying & Sanitation.

A Photographic Survey of Surrey.—A provisional committee has been formed to inaugurate a photographic survey of Surrey, comprising the scenery, geology and natural history, antiquities, buildings, streets, social life and public events of the Surrey of to-day, as well as the reproduction of old prints, maps and records of the Surrey of the past. The hon. secretary *pro tem.* is Mr. H. D. Gower, 55, Benson Road, Croydon.

Bishop's Park, Fulham, is to be extended by the addition of the adjoining ground known as Milder's Meadow, which is $8\frac{1}{2}$ acres in extent. The cost of laying-out the land and embanking the river-front is estimated at £16,957 10s. Of this sum the local municipality will provide £4,957 10s., and the County Council will be asked by their Parks and Open Spaces Committee to sanction a contribution of the balance of £12,000 to the scheme.

"The Sanitation of London."—This is the title of a little pamphlet by Mr. R. Harris Reeves, C.E., which has just been published by Messrs. Hodgetts, Ltd., 13, Clifford's Inn, Fleet Street, price 2s. The author condemns the system of ventilating sewers by openings in streets, allowing the gases to diffuse in the air, and contends that the question is rather one of pneumatics. He states that the main sewers of the London County Council are the chief cause of impure air being distributed throughout the streets of Fulham, which he takes as an instance.

Reigate's Park.—Mr. George Taylor, of Margery, has presented a park to Reigate in commemoration of the Coronation. It is situated on Colley Hill, about half a mile from the station and overlooking the town. It is approached by beautiful wooded walks, one being the celebrated Pilgrim's Way. The view from the park is quite equal to that from Box Hill. It extends for fifty miles, and eleven counties can be seen. At the bottom of the hill is a cave running under the hill for half a mile, which is really an old stone quarry, from which came the stone used in building Windsor Castle and many of the churches in the county. On the north side the park is protected by the Margery Wood of eighty-two acres, which greatly adds to the beauty of the situation.

Law Cases.

Workmen's Compensation: Chimneys Included in the Height.—An important decision under the Workmen's Compensation Act was given by Judge Coventry in the Lancaster County Court on Friday last. A joiner fell from a ladder, and his employer refused compensation on the ground that the building was not 30ft. high from the ground to the roof. It was urged that the chimney should be included in measuring the height of the building under the Act. This made the building 31ft. high. His Honour agreed with this interpretation of the Act, and awarded the compensation claimed.

Southampton's New Building By-laws.—A number of prosecutions under the new Corporation building by-laws were heard at the Southampton Police Court recently. Moderate fines were inflicted. At the conclusion of the hearings, Alderman Button said the sole object of the Corporation and the Works Committee was that the by-laws should be carried out. There was no desire to press hardly on anyone, but the fact that they had such roads as Brooklyn Road, Somerset Road, and a few others, was a scandal, and the Corporation was determined that the by-laws should be carried out in future. He hoped every builder in the town would study the by-laws and see that they were carried out, in which case they would not be put to the annoyance of being brought before the Court.

Re E. A. Cave.—On Thursday last in the Court of Bankruptcy an application for an order of discharge was made by Edward A. Cave, of Langland Gardens, Finchley Road, N.W. It appeared that between 1888 and 1891 the debtor and a relative carried on business together as speculative builders. The debtor was then in employment until 1893, when he resumed business on his own account at Hampstead and

Maida Vale. He estimated the total cost of the buildings since erected by him at between £200,000 and £250,000. The receiving order was made in July, 1900, the liabilities being returned at £27,556; the assets have since realised £50 only. Mr. C. A. Pope, assistant-receiver, reported that the debtor since 1894 had had no capital of his own, and that the successful issue of his operations depended upon his being able to effect advantageous sales of the buildings when completed. His Honour, Mr. Registrar Giffard, said that the debtor had embarked upon operations which were enormously beyond his means, and the order of discharge must be suspended for three years.

Builders' Notes.

The Abbey Brick and Tile Works, Whitley, has started its machinery and commenced to turn out bricks.

London County Council.—At last week's meeting of the Council the report of the Finance Committee for the past year and an estimate for 1902-3 were approved. In moving their adoption Lord Welby reminded the Council that it was committed to great improvements. The Holborn improvement was estimated to cost $4\frac{1}{2}$ millions, of which £2,000,000 had already been spent. This was costing the Council £60,000 a year simply in interest, with hardly any recoupment at present. He hoped the Council would look at the diminishing balance of Exchequer contributions coming in relief of rates; the declining tramway receipts; and on every side they saw already on them, or coming upon them, an increased charge upon the rates.

Engineering Notes.

"Oakley Grange," Shrewsbury, has been fitted by Messrs. John King, Ltd., engineers, of Liverpool, with their "Rahnee" radiators and "Rex" radiator valves.

New Cantilever Bridges in North Tynedale have been erected at a cost of about £1,500 over the North Tyne and Tarsset Burn, near Tarsset. The engineers were Messrs. Sandeman & Moncrieff.

The Technical and Art School, Wakefield, is being supplied with exhaust roof ventilators and inlet panels by Messrs. E. H. Shorland & Brother, of Manchester.

Electric Trams at Northampton.—The Town Council have decided to replace their $7\frac{1}{2}$ miles of horse tramways by the overhead electric traction system, at an estimated cost of £120,000.

Mr. J. R. Bass, M.I.C.E., superintending engineer of the Uganda Railway, was killed recently by a trolley collision at the age of forty-one years. He was educated in Germany, and articulated to a firm of engineers in Westminster. After a time he went to Australia—first to Sydney, where he was for about eighteen months in the engineer-in-chief's office, then to Melbourne, to make a light railway in Gippsland. He was engaged for some years in constructing various road, water and railway works throughout the colony. In 1893 he went to California, and after a short time there returned to England. He left for Mombasa in November, 1895.

American Open-Hearth Steel.—According to the recently-issued report of the American Iron and Steel Association, the total production of open-hearth steel in the United States during 1901, including direct steel castings, was 4,656,309 gross tons. The output for 1900 was 3,398,135 tons, so that there was an increase last year of 1,258,174 tons, or over 37 per cent. In 1900 the American open-hearth steel production for the first time exceeded that of Great Britain, which then amounted to 3,156,050 tons, and was the largest output in our history. The American open-hearth steel made in 1901 was produced by ninety works in fourteen States. In the previous year ninety-four works in seventeen States made open-hearth steel. The output of open-hearth steel made by the basic process in 1900 was 2,545,091 tons, and by the acid process 853,044 tons. In 1901 the output was—basic steel 3,618,993 tons, and acid steel 1,037,316 tons.

UNIVERSITY COLLEGE, LONDON.

Proposed Alterations and Extensions.

THE idea of making provision for University education in London is as old as the days of Queen Elizabeth, when Sir Thomas Gresham instituted the foundation that bears his name; but beyond that foundation, with its varying fortunes, little was done until the beginning of the nineteenth century. At that time on the initiative of Thomas Campbell, supported by a committee of prominent men, University College was founded. The design and plans finally adopted for the buildings were by William Wilkins, R.A., and the foundation-stone of the central block was laid on April 30th, 1827. This block was completed at a cost of £86,000, and was opened on October 1st, 1828; and since then the college buildings have been added to on several occasions, the additions comprising the Brundrett wing, the Birkbeck Laboratory, the north wing and the engineering wing (incomplete). The college has three faculties—Arts and Laws, Science (including Engineering and Architecture) and Medicine.

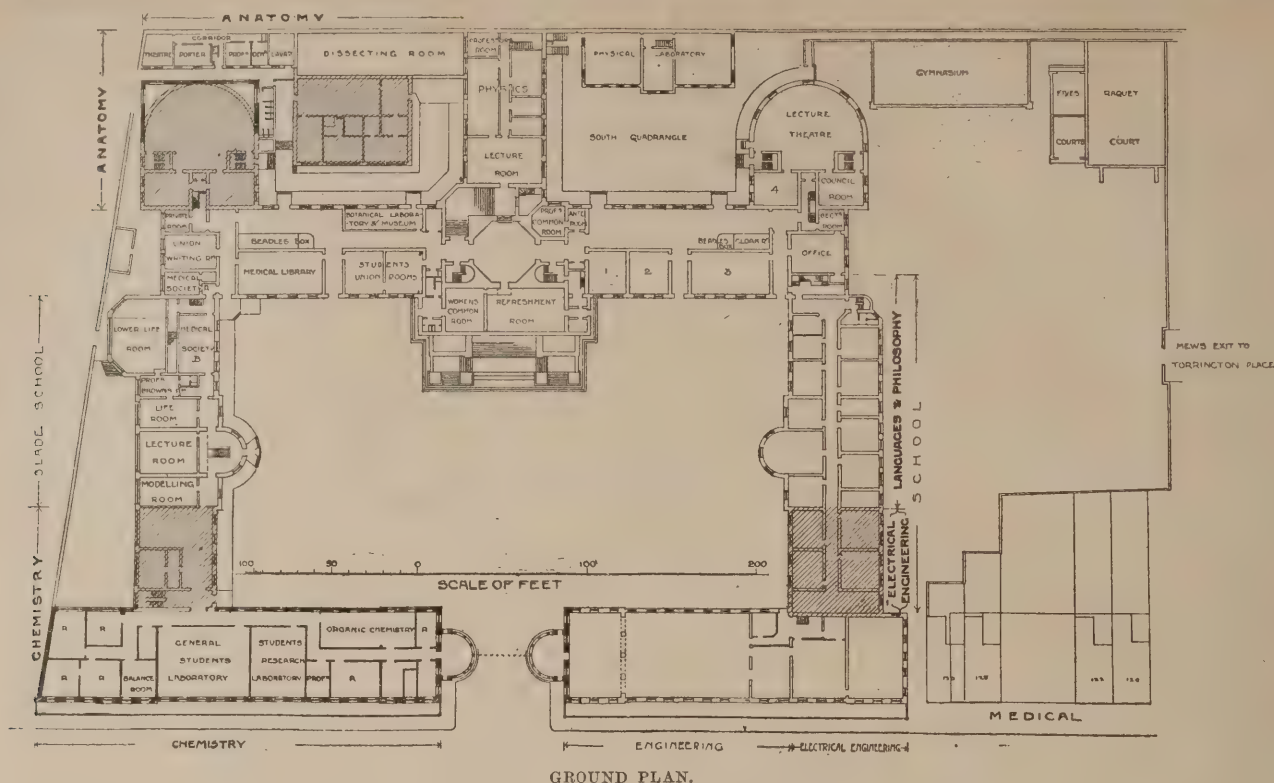
An appeal is now being made for funds to enable the college to be extended, and it is proposed to incorporate it with the University of London. Towards this policy of incorporation the Drapers Company has offered £30,000 to the University and for the same purpose a former student has offered an equal sum to University College.

But these sums are quite insufficient. A further sum of £110,000 is required in order to free the whole of the existing college buildings for University purposes and render incorporation possible. Much larger sums, amounting in all (including the £110,000 already mentioned) to more than a million, are necessary in order to perfect and complete the college. A public meeting in support of the present scheme was held at the Mansion House on Friday last.

Donations and subscriptions should be sent to the treasurer, Sir R. Farrant, at the College, Gower Street, W.C.

The accompanying plans show the alterations and extensions proposed to be made, but they are subject to revision if and when the Council may be in possession of the requisite funds. The plans have been prepared by Messrs. Roger Smith & Son in consultation with the College staff, but it should be understood that they are tentative only: and doubtless when working drawings are prepared there will be some modifications in detail. The lettering in thin letters, usually inside the outline of the part of the building to which it refers, indicates the present use of that part. The lettering in thick letters, placed outside the outlines, shows the intended future use. The portions shown with walls in outline will not be altered. The portions that are hatched are existing buildings which it is proposed to remodel. The portions shown with walls blacked are new buildings.

For the extensions which are immediately necessary the college possesses ample space. At the present time it forms an imperfect quadrangle, of which the west side is incomplete. The whole of the south wing is, however, occupied by the boys' school (University College School), which also has the use of $1\frac{1}{2}$ acres of college land as a playground. In order to obtain the needful accommodation for University teaching and research, it is necessary in the first place to obtain possession of the south side by removing the boys' school, which ought to be provided with a dignified building on a fine freehold site further from the centre of London (it is estimated that the cost of this would be at least £60,000). If the school were thus provided for, its buildings and playground would be available for University purposes. The department of botany might be housed on the top floor, the lower floors being allocated to the faculties of arts and laws, for the provision of much-needed seminars (research workrooms) and classrooms for the modern language and history schools, teachers' training, and other departments. In the second place, the quadrangle must be completed by building the west side. In the south half would be found the extra space required for engineering, applied mathematics and geology; in the north half the upper floor would be devoted to



GROUND PLAN.

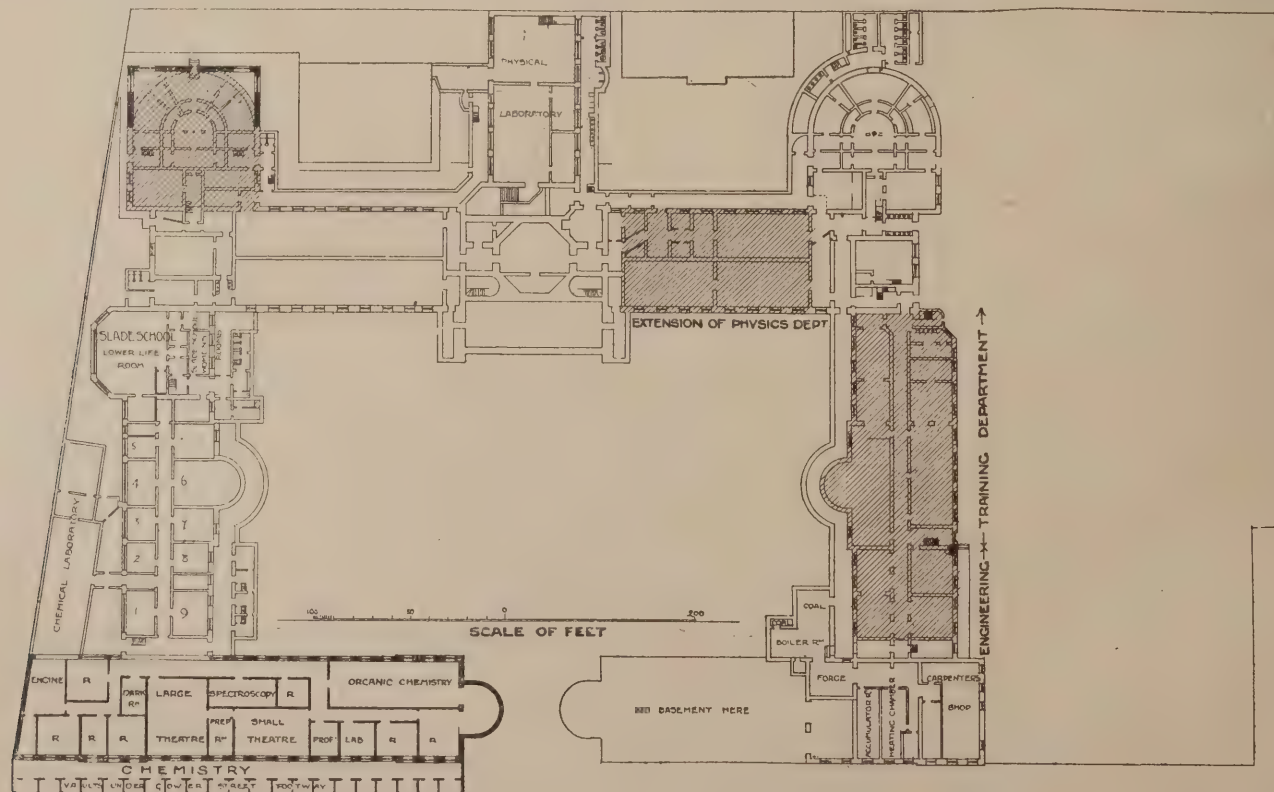
physiology, the first floor to physiological and pathological chemistry, and the ground floor and basement to chemistry. A certain amount of space would in this way be set free in the north wing, and would be altered to accommodate the new department of pharmacology. The increased accommodation in the anatomical department, including the provision of an anatomical museum, as well as special laboratories, will be provided by a remodelling of the north-east corner of the college and of the present low buildings in the courtyard. The rebuilding of this block will also provide the much-needed extension of the zoological department. In the same way the physics department could be enlarged by adding to the present building. The completion of the west wing and its equipment would cost £100,000.

A reference to the plans will show how the proposed arrangements of laboratories will bring together the various departments according to their natural relations, thus providing for that continual interchange of ideas, men and material which is of so supreme importance in the organisation of a University institute. As to the library at University College, this already contains 100,000 volumes, but it is so overcrowded that access to the books is difficult, and sometimes almost impossible. Increased library accommodation is therefore urgently needed. If separate accommodation were provided for the anatomical and pathological collections, the present museum could be converted into a library adapted in every way for its purpose. The present library could then be utilized for displaying the unrivalled Egyptological collec-

tions of Professor Petrie, and would serve as a laboratory for research in this and other branches of archaeology. The cost of these alterations, including the necessary expenditure in bringing the library up to date, would be £10,000.

The Chairs of Architecture and Fine Arts.

It is perhaps opportune to refer to the two chairs of architecture and fine arts at University College. The chair of architecture was instituted in 1841, and was the first chair of the kind in this country. The first professor was Thomas L. Donaldson (1841-65). He laid the foundations for the work of the department, and began the preparation and collection of the large series of diagrams which now form part of the equipment of the classes; he also left funds



UNIVERSITY COLLEGE, LONDON: PROPOSED ALTERATIONS AND ADDITIONS. BASEMENT PLAN.
(Prepared by Messrs. Roger Smith & Son in consultation with the College staff.)

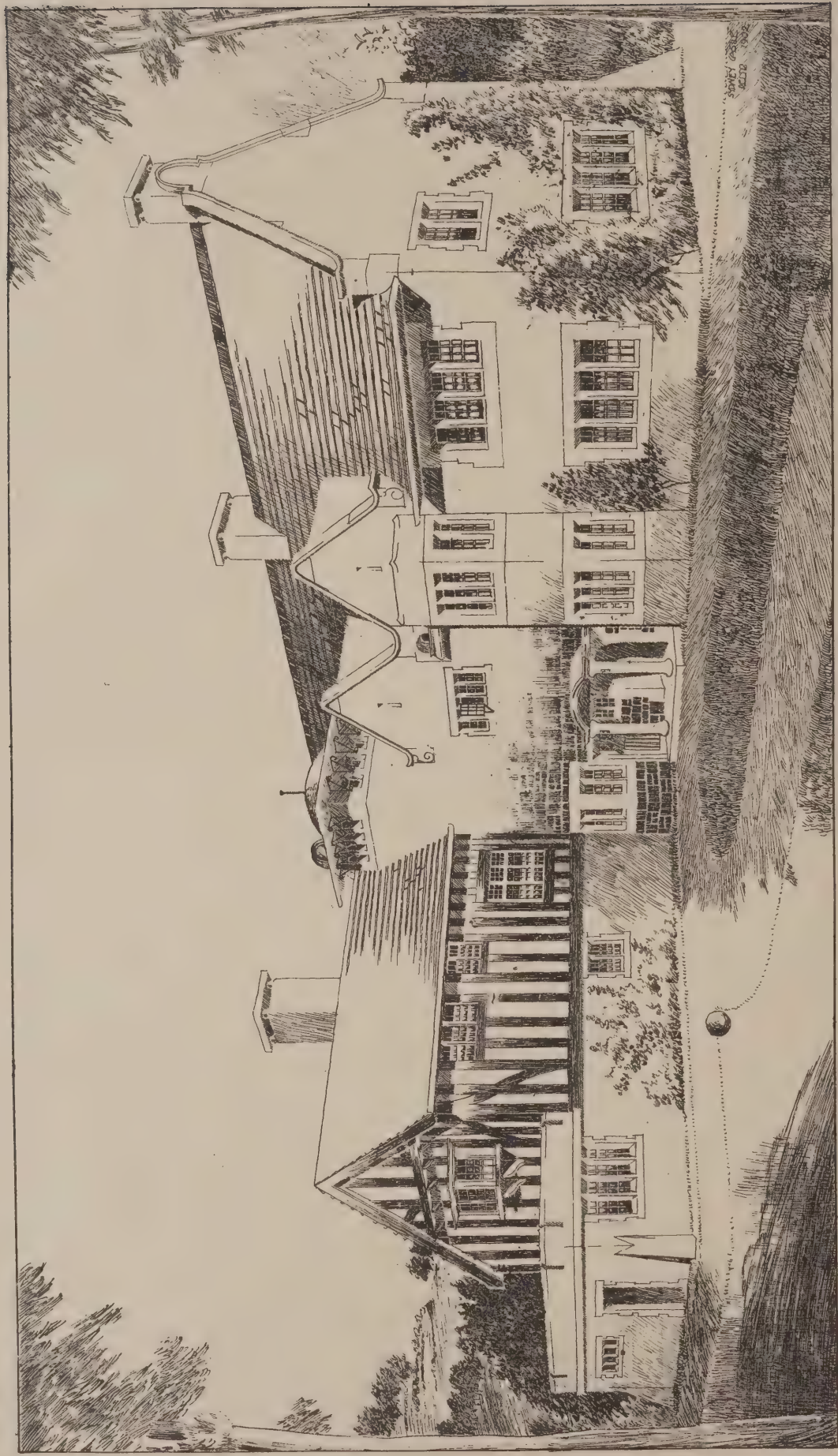


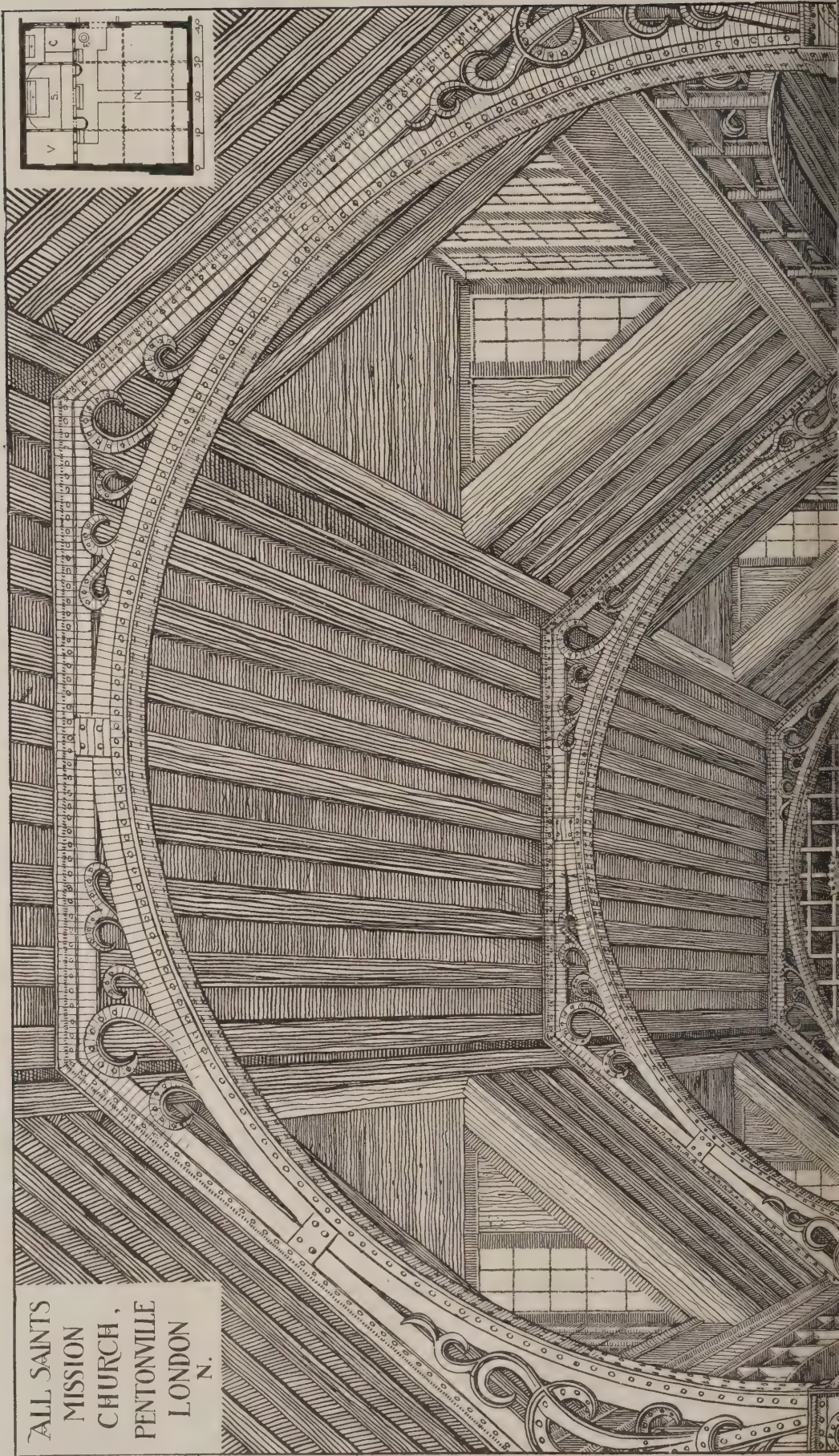
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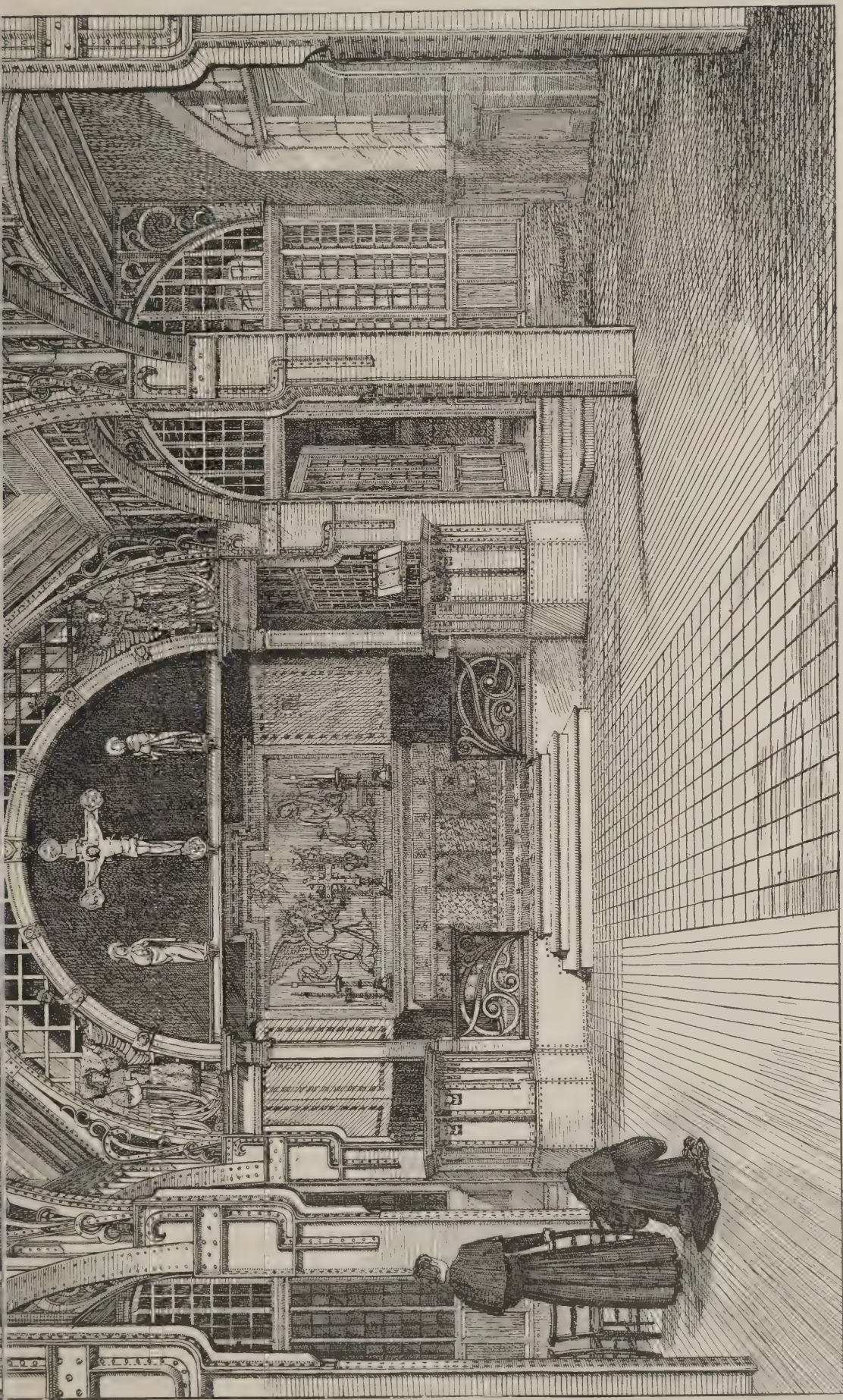
HOUSE AT WOLVESNEWTON, MONMOUTHSHIRE. A. J. HARDWICK, Architect.

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Supplement to
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Wednesday, May 14th, 1902.

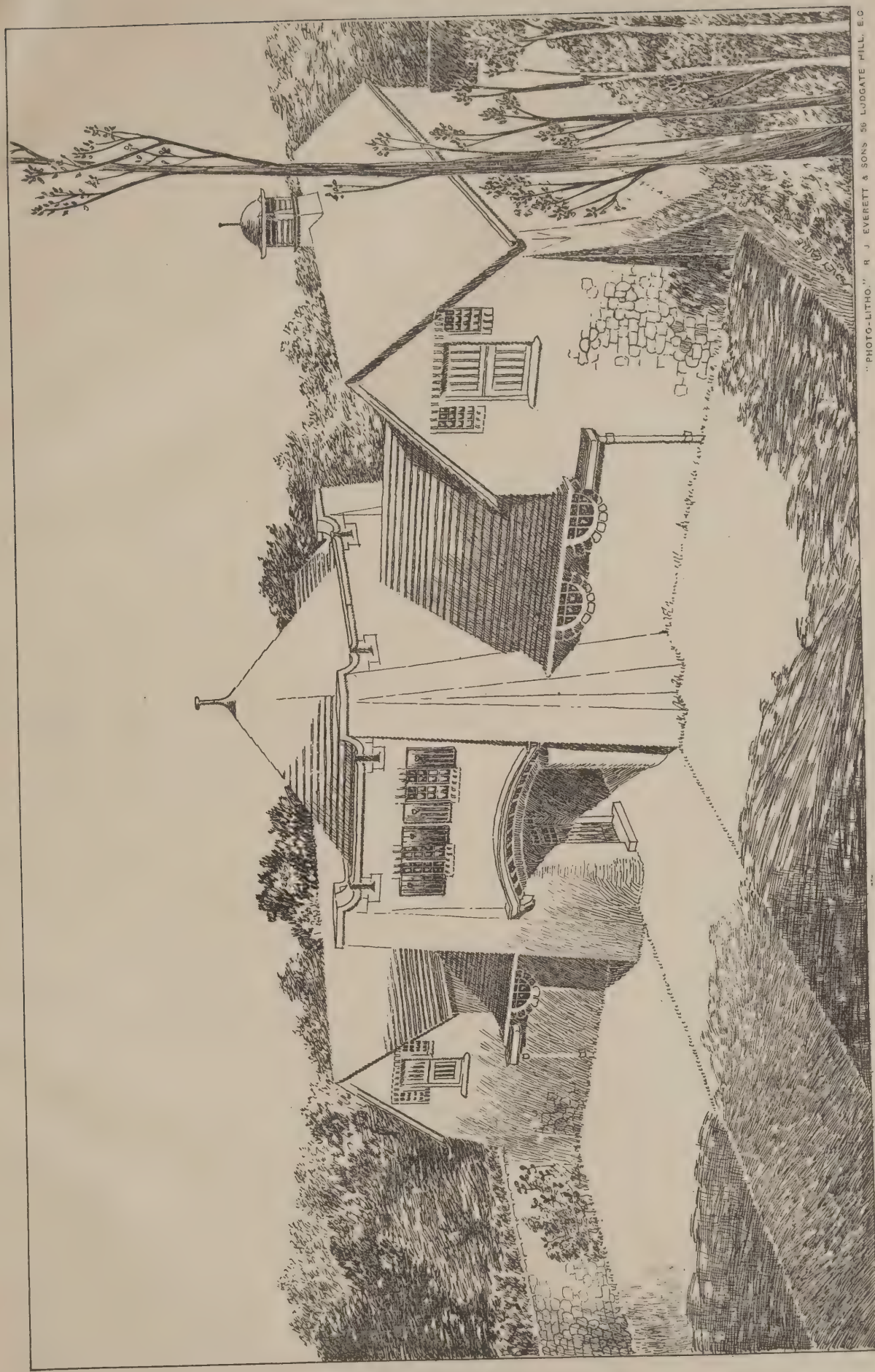
ALL SAINTS
MISSION
CHURCH,
PENTONVILLE
LONDON
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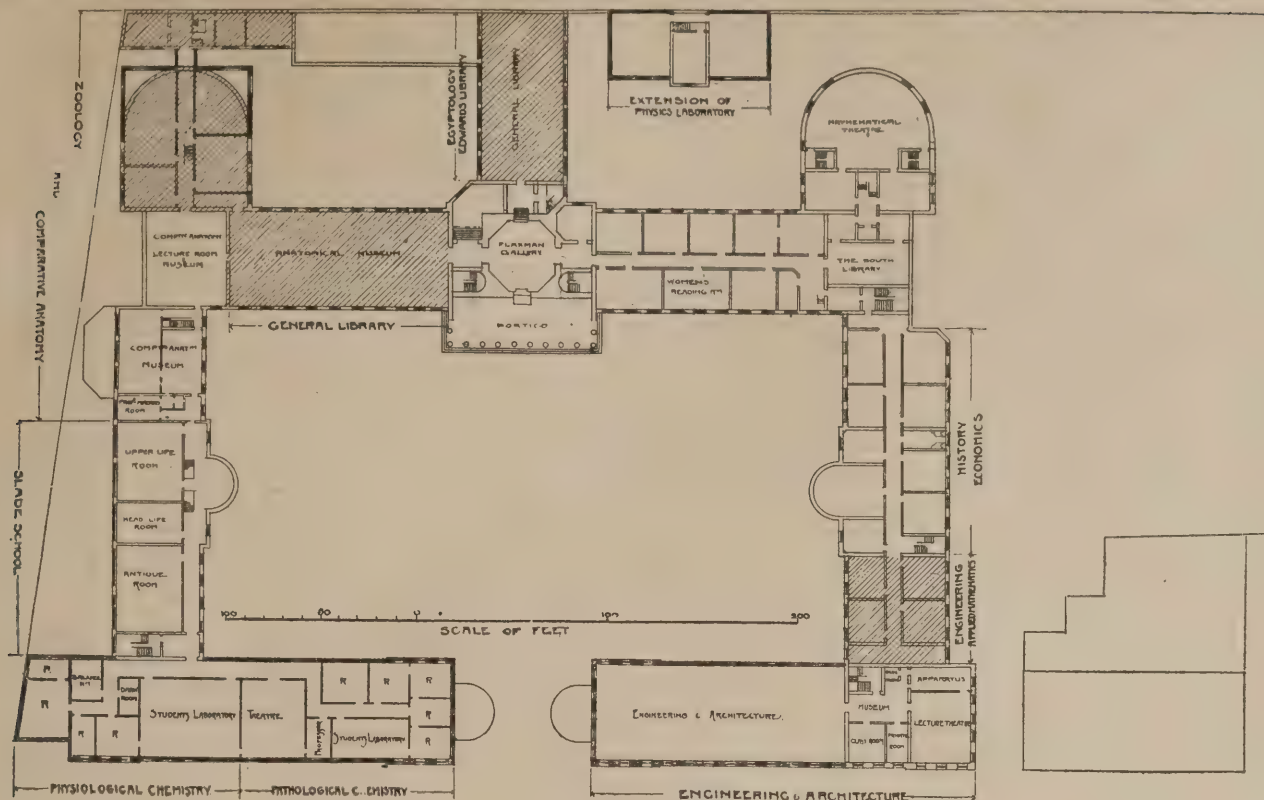
R. A. BRIGGS, Architect. (Drawn by GEOFFREY LUCAS.)

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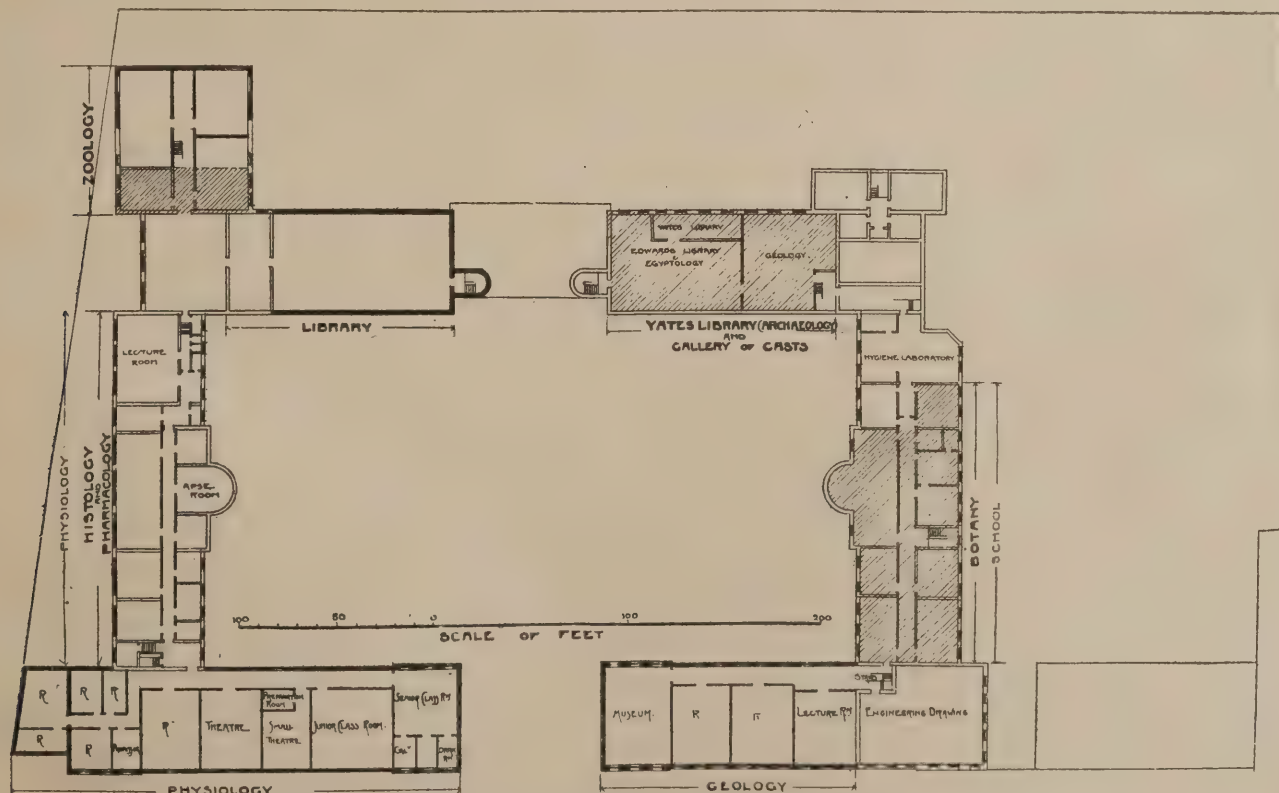


FIRST-FLOOR PLAN.

to provide in each session two silver medals for the encouragement of the study of architecture. His successor was Mr. T. Hayter Lewis, F.S.A., who developed the work of the college classes and who was largely instrumental in establishing and organising the examinations in architecture held by the Royal Institute of British Architects. There is a class for architecture as a fine art, and one for the study of construction: the latter is attended, to a certain extent, by students of engineering. In 1891 the Carpenters' Company established at the college, as part of a scheme for promoting technical education, two evening classes for drawing and instruction under the direction of the professor of

architecture. One is for architectural drawing and the other for the teaching of building construction. More recently a class has been instituted under the same scheme for measuring and estimating builders' work. The entire expense of these classes is borne by the Carpenters' Company. The chair has hitherto been occupied by an architect engaged in practice, and no one else is so fit to carry the work on with advantage to the students; but this circumstance limits the amount of time which can be given by the professor to his duties. Probably the most practicable arrangement would be to have a professional professor as before, to be remunerated by fees, and to give the most im-

portant lectures and general supervision; a well-qualified assistant-professor to take charge of the drawing studio and to lecture on matters which may be allotted to him; and a teacher of measuring and estimating. For the full development of the department more space is required and more complete equipment. The students who attend the lectures on architecture are, nearly all of them, engaged during the day as assistants or pupils in architects' offices; and for their convenience the classes are held in the evening. It will in time be desirable to institute day classes. Space can be found in the engineering wing of the College (when completed) for a museum, drawing-office and lecture-room.



UNIVERSITY COLLEGE, LONDON: PROPOSED ALTERATIONS AND ADDITIONS. SECOND-FLOOR PLAN.
(Prepared by Messrs. Roger Smith & Son in consultation with the College staff.)

SOUTH KENSINGTON EXAMINATIONS.

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—ADVANCED STAGE.

[NOTE.—The questions and answers in the Elementary Stage were published in our last issue. It was only permissible to answer six questions of the paper given below.]

21. EXPLAIN why the sand for mortar should be clean, sharp sand free from clay. What is a hydraulic lime, and in what respects does it differ from rich or fat lime? Portland cement is made from lime and clay; explain the difference between Portland cement mortar and common lime mortar to which clay is added.

a. Because it is found that work done with mortar in which there is any noticeable quantity of clayey or "loamy" matters is very injuriously affected by frost.

b. Hydraulic lime results from burning limestone which contains, finely distributed through it, particles which in some degree make the burnt limestone resemble the burnt clinker of Portland cement. It does not require grinding like cement clinker, but it is slower in slaking than rich or fat lime; mortar made of it "sets," that is, it hardens permanently while still wet. Rich or fat lime results from burning limestone free from clayey matters; it does not "set"; that is, mortar or plaster made of it may dry firm owing to some pastey qualities, but on being re-wetted it returns to the soft condition apparently unchanged from its first condition of soft mortar or "coarse stuff."

c. In the case of Portland cement the lime and clay have been burned together, and a chemical combination exists which does not exist when clay is added to common or rich lime mortar.

22. If it is an advantage to have wide joints for brickwork built with Portland cement mortar, what change in the dimensions of the bricks is desirable for such work? What tests should be applied to a particular make of bricks proposed to be used in important exposed work and built with cement mortar? What are fire-bricks, and how do they differ from common bricks?

a. The breadth and thickness of a brick should bear simple relations to its length: it is necessary that the length of a brick should be equal to twice its breadth together with the thickness of a mortar joint. The length remaining constant, for thicker joints the breadth should be diminished; and if it is necessary to have a definite number of courses, say, four to make 14 in. high, the thickness must also be diminished, so that four thicknesses and four joints will make 14 in.

b. The bricks and mortar ought to have nearly the same rate of expansion and contraction; the mortar ought to adhere to the bricks; a heavy non-absorbent brick is best. Build a cube (or nearly a cube), say $1\frac{1}{2}$ bricks square and 14 in. high; allow a reasonable time for setting under water; dry; re-wet; submit to frost; observe skin of bricks; pull the cube apart; test for adhesion, &c.

c. Bricks which will bear high temperatures without injury or change of shape. In this they differ from common bricks. They are made from fireclays having very various chemical composition. Dinas "fireclay" contains 97.62 per cent. of silica.

23. Take 9 bushels of sand and 3 bushels of Portland cement, and make it into mortar; how many bushels of mortar (approximately) will you have? If upright joints are $\frac{1}{2}$ in. thick and the beds $\frac{1}{2}$ in. thick (allowing for the frog), how many courses of a two-brick wall 12 bricks long will this quantity build? The dimensions of bricks are 9 in. by 4 in. by 3 in. Will you use more mortar per cub. yd. of brickwork in a two-brick wall than in a one-brick wall, and, if so, how much more?

a. Much depends on the coarseness and uniformity of grain in the sand. Using a $\frac{1}{2}$ lb. cocoa-tin as a measure—1 of cement, 3 of sand, and $\frac{3}{4}$ of water gave $2\frac{1}{2}$ measures of cement mortar. Multiply this by 3; the answer is 8 bushels nearly.

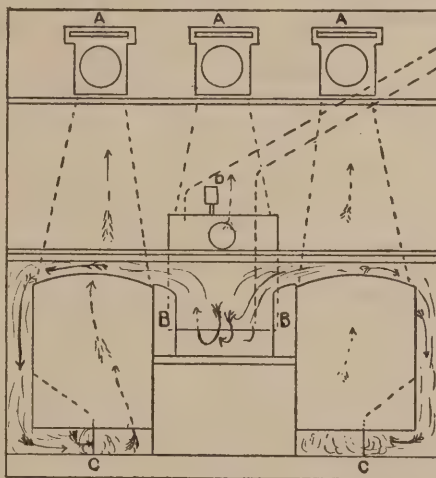
b. Bed of course
 $= 11\text{ in.} \times 18\frac{1}{2}\text{ in.} \times \frac{1}{2}\text{ in.} = 1,845\frac{1}{2}$
 Cross joints
 $= 12 \times 18\frac{1}{2}\text{ in.} \times 3\text{ in.} \times \frac{1}{2}\text{ in.} = 333\frac{1}{2}$
 Longitudinal joints
 $3 \times 108\text{ in.} \times 3\text{ in.} \times \frac{1}{2}\text{ in.} = 486\frac{1}{2}$
 2,664

(Assuming a course of stretchers.)
 2,664 cub. in. in one course.
 46,656 " " cub. yd.
 21 bushels in a cub. yd., say.
 $\frac{46656 \times 8}{21 \times 2664} = \text{say } 6\frac{1}{2} \text{ courses.}$

c. Yes. Of a one-brick wall 4 yds. super. will make a cubic yard; of a two-brick wall, 2 yds. super. will make a cubic yard + 1,296 cub. in. (the mortar in the joints between); it will therefore take nearly 1,296 cub. in. of mortar more per cubic yard for a two-brick wall than for a one-brick wall.

*24. Explain and illustrate by sketches how you would set the kitchen range shown? Show the flues; show by a diagram the connections between the boot boiler and the hot-water cocks in scullery, bathroom, &c. Why is a safety-valve needed? Show where it may be placed.

The drawing is fairly clear. A A A are the dampers to the flues. The circular openings are to allow of the flues to be cleaned. At C C, pieces of iron compel the heated gases to turn towards the front before reaching the upright flue. The flues are allowed to widen so as to expose the whole back of the oven (and roaster) to the hot gases. The hot gases pass under the boot boiler as shown, and then behind the boiler. B B are fire-blocks. The cold supply must come from a tank at a definite height, supplied by a ball cock from the water main. The relief pipe must stand somewhat higher than the cold-water supply tank. It might be supposed, seeing that the cold supply pipe is free and that the relief pipe is also free, that there is no need for a safety valve D; but at night, when there is no movement of water and when the cold supply



SOLUTION TO QUESTION 24.

tank and relief pipe are far from the fire, the water in these pipes may become ice in frosty weather, the pipes thus becoming plugged, and in these circumstances a brisk fire in the range may cause a serious explosion. D is a convenient position for a safety-valve.

25. Sketch neatly to the scale of $\frac{1}{4}$ in., showing the mortar joints with double lines, the elevation of about 4 ft. by 4 ft. of sneaked rubble wall; give also the top of the sample in plan. How many bushels of sand and of lime, and what weight of "stock" (stone), approximately, is needed per cub. yd. for this masonry—the wall is 18 in. thick?

(See illustration to question 9 published in last week's issue.)

Mortar.— $1\frac{1}{2}$ bushels of lime to 6 bushels of sand. The quantity of "stock" to the cub. yd. depends very much upon the nature of the stone and the judgment with which the stock is sent from the quarry: 2 tons to the cub. yd. is a fair approximation.

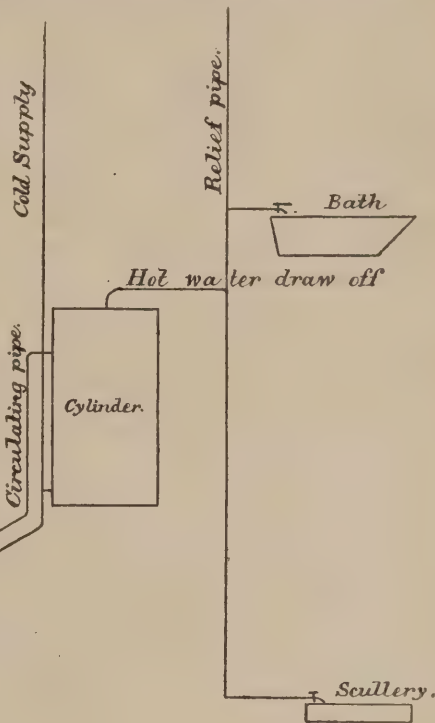
26. How would you prepare 6 bushels of plasterer's coarse stuff (21 bushels in a cub. yd.)? Give the quantities of sand, lime and hair. How many sq. yds. of lathed work will this quantity cover—two-coat work? Describe "scouring" and "setting." How is grey setting stuff prepared? What is gauged putty set, and for what is it used?

(See answer to question 5 in last week's issue.)

For the purpose of answering this question, 1 measure ($\frac{1}{4}$ lb. cocoa-tin) of quicklime was slaked, and it was found to make 2 measures of putty; this mixed with 3 measures of sand made $3\frac{1}{2}$ measures of mortar. This coarse stuff was richer in lime than that generally used.

Take $1\frac{1}{2}$ bushels of quicklime, $5\frac{1}{2}$ bushels of sand, and $2\frac{1}{2}$ lbs. of hair to make 6 bushels of coarse stuff. It will cover about 9 sq. yds. on laths, two coats.

Scouring.—The straightened coarse stuff is allowed to stand till the surface is firm; it is then wetted with a brush and worked over with a hand-float; scouring may be repeated several times; grey setting stuff may also be scoured.



Setting.—The final surface coat, or coats.

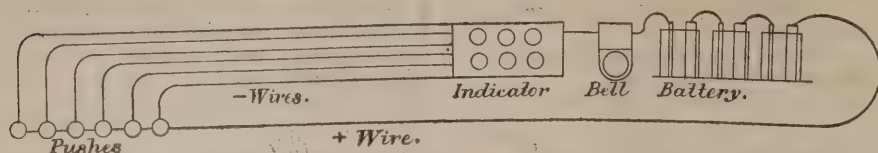
Grey setting stuff is prepared from lime putty and washed fine sharp sand, thoroughly mixed; the sand should be passed through a fine sieve.

Gauged putty set is putty gauged with plaster-of-Paris; it is used for setting ceilings.

27. Describe the mixing of paint from its common commercial state—ground in oil. Describe the complete painting of a new white-lead inside door; it is to be finished a light drab colour. How would you test, for adulteration, a sample of white lead which has been ground in oil?

a. The paint (assumed to be white lead) is taken from the cask and put in a paint-pot, where it is stirred up with boiled oil; it is stained to the required shade by adding stainer (say, raw Turkey umber), and the proper quantity of driers is added. A second paint-pot is now covered with a piece of thin cotton cloth bound with a string. The mixed paint is worked through this with a brush. In this way all pieces of old skin, &c., are removed, and the strained paint may be brought to the proper consistency with boiled oil and turps, when it is ready for use.

b. Any knots are "killed"; use patent knotting (shellac dissolved in spirits of wine). The work now gets a first or priming coat. The white lead for this coat is definitely stained either with red or with a small quantity of lamp-black. When the priming is dry and hard, the work is well rubbed with glass-paper, and all holes (nail-holes, &c.) and defects are stopped with putty. The work now gets a second coat of colour not very different from the finished



Solution to Question 30.

colour—white-lead stained with raw Turkey umber: this coat should have a fair quantity of turps used for thinning (if the work is to be hard). When the second coat is firm the work is again rubbed with glass-paper (note after glass-papering the work should always be well dusted), and a third coat of the same kind as the second coat is given. When this dries it should be seen whether the colour bears, i.e., whether the surface is uniform and that some parts are not "dead" and some parts glossy. If the colour does not bear, give a fourth coat. The final coat is given thinned nearly altogether with turps, so that it dries nearly "flat."

c. Boil in strong nitric acid, which destroys the oil and dissolves the lead on the addition of water: sulphate of barium will not dissolve and the white lead will dissolve. (Rivington.)

28. You have to slate a house of which the eave is 23ft. from the ground. Describe how you will proceed with the work: dress the slates, scaffold, provide battens and nails. How will you dress for mitre valleys and hips? Sketch a slate (24in. by 12in.) holed and dressed. At what parts of a roof does waste occur? How many square inches of complete roof may one slate (24in. by 12in. and 4in. lap) be supposed to cover?

The slates are tried for square; dressing marked; and holes marked, from blade of T-square. Holes are punched with punching tool. Put up hanging cripples to carry three breadths of 9in. by 1½in. boards at a height of 3ft. below eave. From this light scaffold work is commenced. See that valleys are properly sheeted and the lead in place. Nail on the tilting-piece: nail on battens to the proper gauge: see that raglets are right: measure exact length of rafter (this should be done before holing so that any waste of slate due to the length may be given as increased lap). The doubling eaves-course is of slates cut to be 14in. long. The battens are 3in. by 1in. nailed with 2½in. steel nails. Slates nailed with 2in. galvanised iron nails. To cut the slates for mitre valleys and hips, nail three light laths together as a triangle to give the exact angle to which the slates must be cut. Keep your perpend right. For working on the finished slating use creepies to carry the ledger. You must finish at the ridge with two thicknesses of slating. At chimneys, &c., work your soakers in with the slating; see that the covers are secure in the raglets, &c. Set the ridge tiles on a full bed at each joint, cut off the mortar flush; see that the slates are not smeared. Render inside with good rich well-haired plasterer's coarse stuff.

(See solution to question 6 in last week's issue.)

Waste occurs at eaves, at hips, valleys, skylights, chimneys, finishing end of roof, ridges. A slate may be supposed to cover the area of its margin; with the slates as given, each slate covers 120 sq. in. of roof.

29. Draw carefully to the scale of $\frac{1}{12}$ the half-outside elevation of a double-leaved hall or porch door. The door opening is 7ft. 3in. by 4ft.: the door, each leaf in three panels; top panels raised centres, collection moulded; lowest panels flush and beaded. Show top light and sidelights. The opening—soffit of reveal to top of door sill 9ft.; from reveal to reveal 7ft. 6in. Give a vertical section from 6in. above soffit to door step, showing door frame and sash of top light, and passing through panels of door, showing weather board and door sill.

(See accompanying illustration.)

30. Of the two wires to an electric bell push one is found to be more liable to be injured by corrosion than the other. Assuming that these two wires go directly to the battery, one of them is attached to a zinc rod and the other to what projects above a "porous pot": which wire is most liable to corrosion? What special

care would you give to the corroding wire to prevent its corrosion? Show by a diagram how you would connect a number of pushes with the bell indicator, and battery, so that there will be a minimum quantity of corroding wire. (33)

a. The wire attached to the porous pot.

b. It should be very carefully and well insulated and kept dry.

(See accompanying illustration.)

*31. Skeleton drawing of a bridge truss loaded as shown; transfer it to your paper. Draw the stress diagram to the scale shown; mark on the truss the amounts of the stresses in cwts., showing compressions by the sign + and tensions by the sign —. (36)

(See accompanying illustration.)

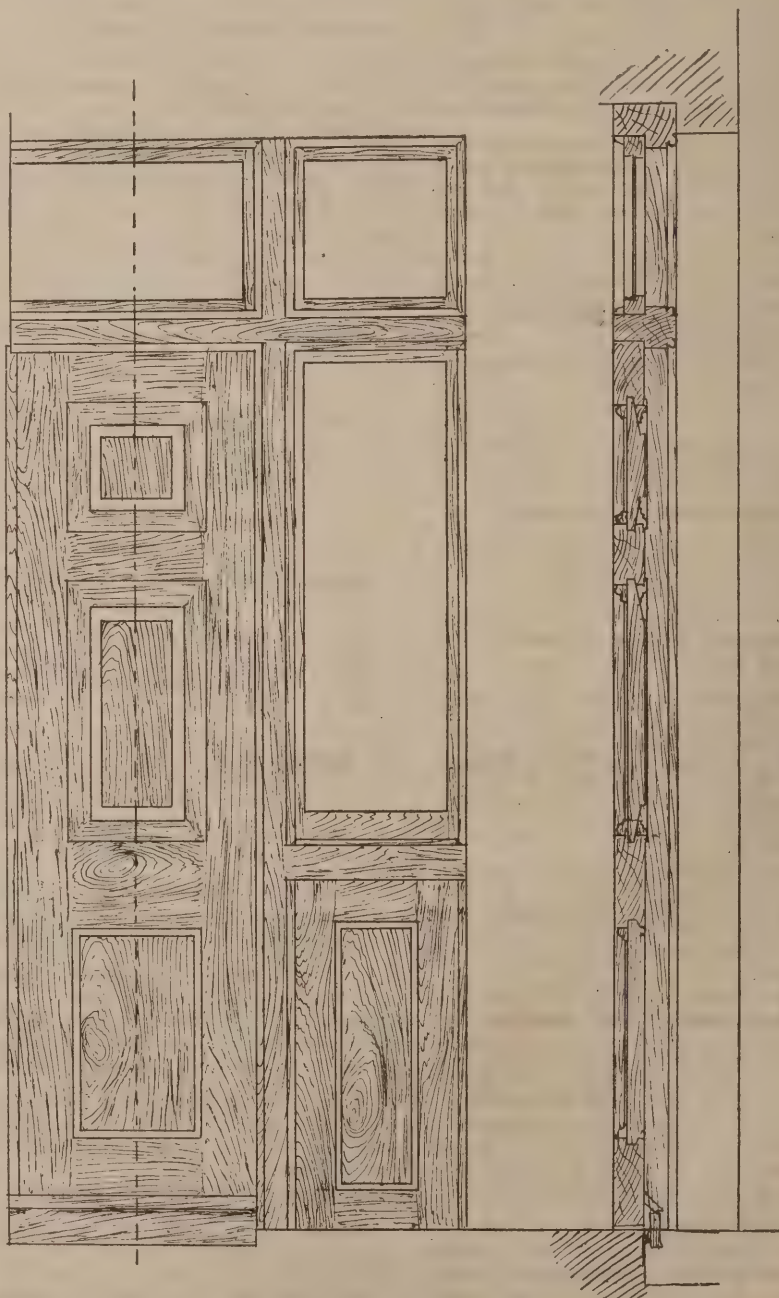
(NOTE.—This is an ordinary piece of stress

drawing, but the question tests rapidity of work. Students should practice rapid work of this kind. Accuracy is of more importance than rapidity, and if any portion of the question is to be left uncompleted, it might preferably be the marking of the stresses on the truss. The next question is shortened by the work of this question.)

*32. In the truss of the previous question loaded as shown, what is the bending moment at B C and by what stresses is it resisted? Of what use is the member D? (36)

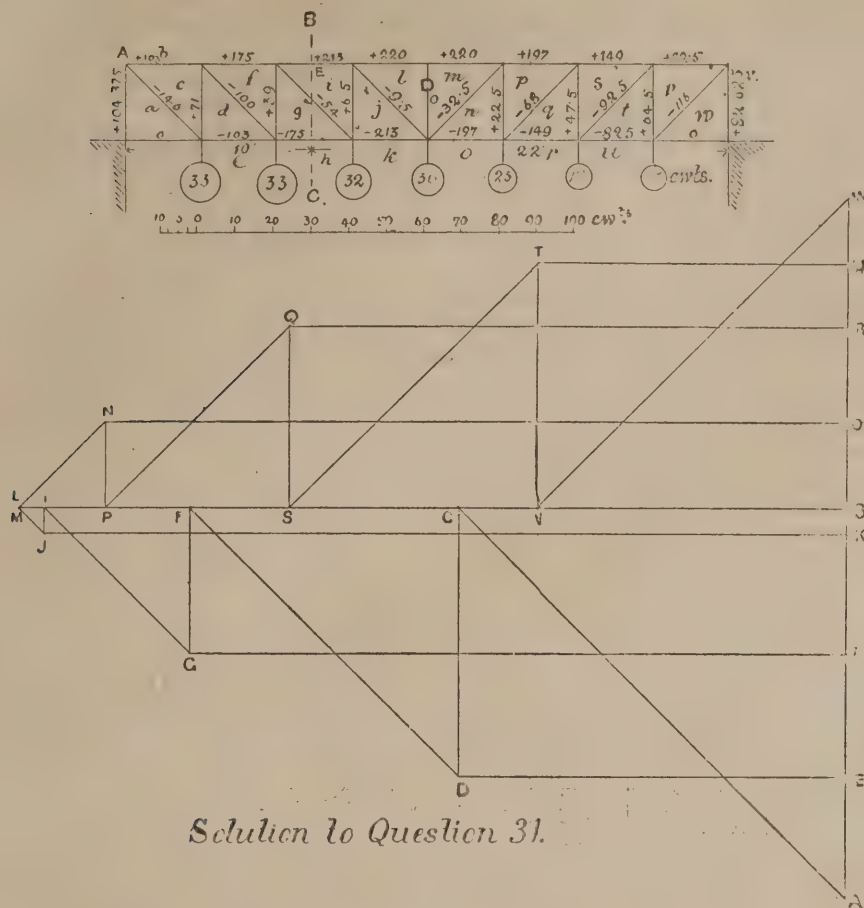
a. $104 \cdot 375 \times 10 = 1043 \cdot 75$. $1043 \cdot 75 - 33 \times 2 - 33 \times 6 = 761 \cdot 75 =$ bending moment. It is also the moment of vertical forces to the left of B C about the point E. These forces are resisted by stresses — 54 in the brace, + 213 in the top boom and — 175 in the bottom cord. Taking the moments of these stresses about E, we have $776 \cdot 35$ ($54 \times \sqrt{2} + 175 \times 4$) which, seeing that the stresses — 54 and — 175 are round numbers, is in fair agreement. The perpendicular distance of E from the brace (— 54) may be found graphically, but as half a bay is 2ft. this distance is manifestly $\sqrt{2}$ ft.

b. The truss is made use of as a parapet or fence, and D is of use for this purpose; it also strengthens the top boom as shortening the "strut," which would otherwise be a two bay strut.



Solution to Question 29.

(31-32)



Solution to Question 31.

ARCHITECTURAL ASSOCIATION.

MUNICIPAL HOUSING AND ARTIZANS' DWELLINGS.

BY OWEN FLEMING AND LOUIS AMBLER.

THE Architectural Association held its last meeting of the session on Friday evening last, the chair being occupied by Mr. Seth-Smith. After the minutes of the previous meeting had been read and confirmed, Messrs. H. H. Fraser (London, W.), W. Guthrie (Chelsea), G. S. Mitcham (Beckenham) and J. E. Mundell (London, N.) were elected members of the Association. The following additional donations to the New Premises Fund were then announced:—

	£	s.	d.
G. T. Hine	50	0	0
Max Clarke	15	15	0
O. Gilbertson	5	5	0
Alexander Wood	5	5	0
J. S. Blunt	3	3	0
A. W. Turnbull	2	2	0
Horace Field	2	2	0
T. Bee	1	1	0
E. Carless	1	1	0
Walter Hearn	1	1	0
R. E. Hemingway	1	1	0
G. W. Jones	1	1	0
W. M. How	1	1	0

Donations previously announced £4,127 4 6

Total - £4,217 2 6

Mr. Owen Fleming (L.C.C.) then read his paper on "Municipal Housing: Its Economic Basis." After referring to several housing experiments, he pointed out that the first point to be examined was the soundness of the financial basis. Checking influences might arise from either of the three classes of persons which co-operate in the work of municipal housing: (a) the stockholders; (b) the ratepayers, represented by the municipalities; (c) the rent-payers.

The Stockholders.

The functions of the stockholders are briefly to provide the sinews of war. The method of raising money, however, varies in different cities. The rate of interest paid for the housing

work of the London County Council has been fixed at 3 per cent. Loans are raised for definite periods, varying from thirty years in the provinces to sixty years in London and Glasgow. In Glasgow the Corporation maintains what is known as a "Floating Loans Fund." Liverpool and Manchester apply to the Local Government Board for a separate loan for each housing undertaking. One of the most interesting aspects of housing finance is the question of the sinking fund for the compulsory repayment of loans. Parliament has formulated certain Standing Orders which require that all moneys advanced to local authorities in Great Britain shall be repaid within certain fixed periods. I use the term "Great Britain" advisedly, because the policy of loan repayment does not seem to commend itself to the Colonial mind. At present the sinking fund term varies from thirty to forty years in the provinces to sixty years in the metropolis, but there seems to be no reason why the provinces should not be brought up to the same scale as London.

The method of sinking fund repayment differs in different cities. In London the system adopted is what is known as the cumulative annuity system. To illustrate it, suppose a snowball were formed out of the receipts, and set a-rolling at the end of the first year after the buildings were opened. This snowball would continue rolling during fifty-nine years. At the end of the second year, a second snowball of the same size as the first would be formed and set off on a similar journey. And so on each year during the whole fifty-nine years. When the sixty years were ended, the fifty-nine snowballs, which by that time would have assumed fifty-nine different sizes, would be rolled into one ball, and that great ball would represent the total amount of the loan. In some other cities repayment is secured by the provision of equal annual instalments of principal, with the result that the charge for interest and sinking fund is greater during the earlier years of a loan than at the later period. The disadvantage of this latter system, known as the instalment system, is that it is very difficult to arrive at an annual estimate of

receipts and outgoings, and the difficulties of producing a proper housing balance-sheet are needlessly enhanced.

The Ratepayers.

The functions of the second class of persons concerned, namely, the ratepayers, are somewhat analogous to those exercised in ordinary business by executors and guarantors; as executors they have to manage the estate as a trust and not for personal profit; as guarantors they have to make good the deficits, if any. Skillfully managed on ordinary business principles a housing estate should pay its way, but if any deficit appears it has to be made good out of the current rate. It is therefore highly important in the interests of the ratepayers that the housing accounts of a municipal corporation should be kept entirely distinct and published separately from the general accounts. Summarised, the financial change in the London housing accounts from the date of their inception to March 31st, 1901, is as follows:—

DECREASE IN VALUE.

	£	s.	d.
Rate-subsidy -	6,943	17	1
Depreciation in value of estates -	?		

INCREASE IN VALUE.

Sinking fund account -	19,811	12	2
Reserve fund for repairs -	8,934	18	2
Cash in hand -	4,033	4	7
Appreciation in value of estates -	?		
(Capital expenditure to March 31, 1901 =	£772,125	3s.	5d.)

The Rent-payers.

This class of persons occupies a position contrary to that of the stockholder. It has no permanent interest in the estates. Speaking generally, I think it may fairly be assumed that rent, like water, will in time find its own level.

The Sinking Fund is framed on the assumption that the land and buildings will be valueless at the expiration of the period. This assumption is clearly inaccurate, as the land and buildings will possess a very considerable value at that date. But the Sinking Fund is accumulating more rapidly than the actual value of the property is diminishing.

To illustrate the growth from actual figures a table is given showing the annual amounts of the Sinking Fund accumulations in the London estates. The totals given against each year's dates represent the sum of (a) total of previous years' accumulations; (b) interest upon total of previous years' accumulations; (c) normal annual instalments from buildings already in fund; (d) first annual instalments from new buildings completed within previous years.

Year.	Sinking Fund.
1895-6 -	£1,103 11 5
1896-7 -	3,228 13 9
1897-8 -	6,757 8 0
1898-9 -	10,582 3 8
1899-1900 -	14,536 10 5
1900-1 -	19,811 12 2

Such are the financial conditions which govern the housing work of British municipalities, and it is now proposed briefly to indicate the process by which the actual work of housing is carried on under these financial conditions.

When a housing scheme has to be prepared the simplest method of procedure is for the architect to prepare a preliminary plan showing approximately the character of the buildings that could be placed upon the site. An estimate should then be prepared of the cost of erecting the building shown on the plan. This should include all the probable capital expenditure, i.e., cost of land, building, architects' fees, quantities, wages of clerk of works, lithography, and all items properly chargeable against capital. It is generally wise to make a preliminary estimate on a cube basis, founded on previous experience. If the financial margin is then felt to be too narrow, rough quantities form a useful check. The sketch plans are then forwarded to the housing manager for the probable rents and annual outgoings to be estimated by him. These estimated figures should not be the rents and outgoings in force at the time of the estimate, but a forecast of those that will probably be in

force midway through the sinking fund term. In order to facilitate comparison with the estimate of cost, the nett annual income reported by the housing manager is converted by him into capital form, and this figure is technically known as the amount available.

The next step is for the preliminary estimate of cost to be compared with the preliminary amount available. If the amount available exceeds the estimate of cost the scheme possesses the elements of success. When the officers concur that the scheme is the best that can be devised, it is presented while in its preliminary form to the Housing Committee, and if then it is fortunate enough to meet with approval it is finally presented to the municipality in the form of a typical year's balance-sheet, which, if approved, forms the standard with which all subsequent balance-sheets are concerned.

Example of a Housing Balance-sheet.

Accounts prepared to show the estimated effect on the rate of certain working class dwellings:—

(a) MAINTENANCE ACCOUNT.

Receipts.		£	s.	d.
To Gross rental -	- - - -	468	0	0
Less—Empties -	- - - -	14	0	9
		£453	19	3
Expenditure.		£	s.	d.
By Rates and taxes -	- - - -	84	19	6
" Water rate and insurance -	- - - -	18	6	0
" Repairs -	- - - -	51	9	7
" Supervision and collection of rents, &c -	- - - -	31	4	4
" Contingencies -	- - - -	11	14	0
		197	13	5
" Balance available for payment of interest and sinking fund -	- - - -	256	5	10
		£453	19	3

(b) INTEREST AND SINKING FUND ACCOUNT.

Receipts.		£	s.	d.
To Balance brought down from maintenance account -	- - - -	256	5	10
Expenditure.		£	s.	d.
By Interest on cost, viz.: -	- - - -			
Land (value for housing purposes) -	1,000			
Buildings (including all incidentals) -	5,261			
	£6,261			
Interest at 3 per cent. on £6,261 -	- - - -	187	16	7
" Sinking fund to replace capital raised, £6,261, in fifty-nine years by cumulative annuity at 2½ per cent. -	- - - -	47	10	10
" Estimated annual surplus -	- - - -	20	18	5
		£256	5	10

If the procedure here outlined is carried out with care and judgment there is no reason why the housing work of a municipality should not proceed smoothly and without giving ground for reasonable public criticism. If progress is to be quickened it should be accomplished by endeavouring to widen the space between the boundary limits rather than by overstepping them. This can be done either by—

(a) Reducing the cost of production by improved organization, taking full advantage of modern machine production;

(b) Increasing the amount available by perfecting the system of management;

(c) Extending the Sinking Fund term.

Mr. Louis Ambler's Paper.

At the beginning of his paper on "Artizans' Dwellings from the Private Point of View," Mr. Louis Ambler said that in planning buildings one of the chief difficulties was the restrictions of the sites, and whereas for municipal artizans' dwellings the sites were usually planned as part of a large scheme, with wide streets and open spaces, the sites for buildings of this class erected by private individuals were frequently plots of ground hemmed in by buildings on two or three sides, and with comparatively narrow streets in front. Consequently, what would be considered the standard minimum sizes for rooms in municipal artizans' dwellings would not be adhered to in the case of private buildings of the same class, but a lower or smaller standard would be considered sufficient.

It may be well to consider the evolution of the artizans' "dwelling," as it is called, from the simple cottage or row of cottages. The simplest example is perhaps the two-storey building as shown on the plans of those erected on an estate in North London. Each division between the

party walls contains two separate self-contained tenements—practically a complete cottage on each floor—each with its own approach from the street and front door, and its own yard and small garden behind. The average total cost of these buildings was about £120 each couple of dwellings. The ground-floor tenement lets for 8s. per week and that on the first floor for 9s., the owner paying the rates, &c. The rate of interest on the total outlay is about 6 per cent. I may here remark that buildings of this class should be erected by contract if they are intended to pay.

The "clerk of works and no contract" system may be all very well for a house which the owner is building for himself and where he can perhaps supply part of the materials off his own estate. Then his only object is to have the best work—more or less regardless of cost; but in the case of artizans' dwellings to be built to pay it is a very different matter, and I believe that the contract system is the only feasible method of doing such work for private individuals.

A further development of the cottage-flat type of dwelling may be seen in the plans of those in Lisson Grove, where each tenement occupies two storeys instead of one, each having its separate gate and entrance from the street, and each its own portion of the yard space in the rear. The cost of these buildings was at the rate of 6½d. per cub. ft., or an average of £60 per room, sculleries and other offices, &c., being thrown in. The lower tenement is let for 11s. a week and the upper one for 13s., this being at an average of about 2s. 3d. per room inclusive of rates and taxes. The buildings pay at the rate of 5½ per cent. on the total outlay.

We now come to the third type of artizans' dwellings, that is, the block of tenements having a common staircase. As staircases, landings and passages are not directly rent-producing, they must necessarily be reduced to a minimum, and the larger the number of rooms approached by one staircase the more economical is the arrangement, provided that space be not wasted in passages. The other most important point in the planning, with regard to economy, is that the building should be if possible a simple parallelogram, two rooms deep, and without any breaks or projections either back or front, as these involve thick walls all round, and add considerably to the cost.

All buildings for the artisan classes should be as fire-resisting as possible, and the construction should be solid throughout, with no hollow spaces for dirt and vermin to collect. The floors should be of cement-breeze concrete, with the boarding nailed directly on to the concrete, the boards of the lowest floor being tarred underneath. I have found 1 part of Portland cement to 6 parts of clean, sifted gas breeze suitable for floors, and the same in the proportion of 1 to 5 for staircases and landings; the floors 6in. thick being finished with a floated face in cement and fine-sifted breeze to receive the wood flooring, and, where not boarded, finished with 1in. thick smooth Portland cement floated bed. The concrete of the upper floors and landings has ½in. solid square wrought-iron rods embedded in it, 1ft. apart, 2in. above the underside of the floors, the rods being in as long lengths as possible, and laid on fir beams, usually about 9in. by 6in., fixed about 4ft. apart, and notched at the top to form a key for the concrete floors, chases at least 1in. deep being left in the walls for the same purpose. These floors are much less expensive than the usual steel or iron joist and concrete fireproof floors. All window and door-frames and linings should be bedded solid, and casements are preferable to sashes, on account of the hollow spaces in the sash-frames. Casements are, however, frequently broken off their hinges, or the hanging stiles are often broken by being flung open too violently, but sash-lines and beads suffer similarly, so there is not much to choose between them on that score. Skirtings should all be of cement, and no woodwork should be used where it can reasonably be avoided. Staircase balustrades and handrails should be of iron. If of wood they are frequently used for firewood. Ranges and coppers should be portable, so that they can easily be taken out and replaced when necessary. Service water-pipes should be of iron as far as possible, not lead. Granite plaster, laid in two coats, is much harder than ordinary lime plaster in three coats, and costs very little more. I think the best finish for plaster walls in these buildings is

washable distemper, the staircases and landings having high painted dadoes. Some people prefer the living-rooms papered; the tenants certainly do. For all external painting I like ivy-leaf green, and for internal woodwork the most economical and serviceable treatment is staining, say American walnut colour, and varnishing. Sanitary fittings should be of the plainest, simplest and strongest quality, and lead waste-pipes and soil-pipe connections should be avoided. The former should be of earthenware and the latter of galvanised cast-iron, made to the required length and angle. Cross-ventilation is essential in all parts of the building, by means of windows and doors, not ventilators or air-bricks, which the tenants stop up if they can get at them. Ventilating air-bricks are, however, desirable close to the ceilings of the water-closets, and where the top landing window of a staircase is much lower than the ceiling a ventilating-shaft from the highest level of the ceiling may be an advantage. Open air staircases are now almost universally condemned, and I think them objectionable, as a rule. Dust-shoots are most undesirable, in my opinion, and the pail or dust-bin emptied every day meets all requirements in that respect.

Mr. Francis Hooper proposed a hearty vote of thanks to the retiring president, Mr. Seth-Smith, who had devoted himself so thoroughly to the Association during his two years of office. Under his direction two very important schemes had been organised—the Day School and the New Premises Fund. Mr. Seth-Smith, in returning thanks, referred to the great underlying idea of the Association, that London should be a city of beauty and that no single ugly building in it should be the work of one of their members. He did not think there was another society of artists that could show such a record of devotion to their successors.

Dr. Sykes, in opening the discussion on the papers that had been read that evening, observed that when a municipality was about to erect working-class dwellings on a site it was presented by Parliament with the difference between the market value and the housing value; a distinct advantage over the private individual. It should be noted that if property increased in value it also increased in rental and this introduced a class of tenants quite different to those for whom the buildings had been intended to be built. It was not possible to build for the very poor. They would house in the worst manner, and it was degrading to descend to their level. Houses should be built as homes, not as sardine-boxes or packing cases. In crowded districts like St. Luke's, it was imperative to build great blocks of flats, and this produced a condition of things which was very complex. Mr. Ambler had mentioned the provision of one-room dwellings; but these we did not want; the difficulty was to secure dwellings in which families could live decently. With regard to open staircases, he thought they were quite proper, as they ventilated the rooms separately and did not let them ventilate one into another. Dwellings should be made as private as possible. Let each have its own water-tap, and scullery as well if possible; and if there were to be common wash-houses let them not be used on one day by more than one family.

Messrs. Guy M. Nicholson, W. J. H. Leverton, and H. P. G. Muir also spoke, Mr. Fleming replied, and the meeting then terminated.

Masters and Men.

Carlisle Painters' Strike.—The demand of the Carlisle painters for a week of fifty-four hours at 8d. per hour has been conceded by a number of masters. A fair proportion of the men are, however, still without employment.

A Strike at Swansea has occurred of 500 men employed in the various engineering shops and new mills at Mannesmann Tube Works, Llandore, on account of the employers introducing automatic timekeepers, which are alleged to be to the workmen's disadvantage.

The Bristol Master-Builders' Association have served a notice upon the operative societies, which comes into operation on the 30th June and deals with alteration of rules and a reduction of wages to the extent of one penny per hour.

Keystones.

Mr. H. K. Bromhead, as president of the Glasgow Institute of Architects, has been elected to the Fellowship of the R.I.B.A.

St. Peter's Church, Corby, has been restored from plans by Mr. J. C. Traylor, A.R.I.B.A., of Stamford, at a cost of about £3,000. The work has been carried out by Mr. J. C. Halliday, contractor, of Stamford.

New Poor Law Offices at Todmorden have been erected. The style adopted is Gothic, the building being in Yorkshire stone, from the design by Mr. Jesse Horsfall, architect, of Manchester and Todmorden.

Mr. William Elliott, of Exeter, died recently. He was well known as a clever craftsman, was of Somersetshire birth, and was apprenticed at Taunton. After serving his time he came to Exeter twenty-six years ago to join the staff of Messrs. Harry Hems & Sons, in whose service he had remained ever since.

A New Isolation Hospital has been erected about a mile from Chinley and the same distance from Chapel-en-le-Frith. It consists of four separate blocks of buildings built of stone. The contractors were Messrs. Scattergood & Warrington, New Mills; and Mr. E. W. R. Bryden, of Buxton, was the architect. The cost was about £13,000.

Devon and Exeter Architectural Society: Three Towns Branch.—The sixth annual meeting was held on Wednesday last at Plymouth. After the annual report had been adopted the officers for the ensuing year were elected as follows:—Chairman, Mr. A. S. Parker, A.R.I.B.A.; hon. secretary and treasurer, Mr. B. Priestley Shires, A.R.I.B.A.; hon. librarian, Mr. W. H. May, M.S.A.

Malmesbury and District Technical and Secondary School.—The foundation-stone of this building was laid last Thursday by the Mayor of Malmesbury, Mr. William Forrester. The contract for the building, exclusive of fittings and cost of land, is £3,833, the contractors being Messrs. Smith & Light, of Chippenham, Wilts. The architect is Mr. Robert E. Brinkworth, F.S.I., of Bath and Chippenham.

Coronation Depredations.—At the Abbey many yards of beautiful turf have been destroyed and a fine row of trees mutilated. Along Constitution Hill many trees have suffered for the "great stand." St. Clement Dane's little garden in the Strand has been almost annihilated. Magnificent turf has disappeared before the Admiralty erection, and flower beds bursting into blossom have died untimely. A protest against these and other depredations has been issued by the secretary of the Metropolitan Public Gardens Association.

The Kirkcaldy District Joint Infectious Diseases Hospital, erected on a convenient site off Strathore Road, near Thornton, has been opened. Some time ago competitive plans were asked for the buildings, and the district committee, acting on the advice of Mr. Morham, architect, Edinburgh, selected those of Messrs. Fryers & Penman, architects, Largs. The buildings consist of an administration block, attached to which is the observation ward; scarlet fever block, typhoid block; diphtheria block; and block containing heating apparatus, washing-house, disinfecting chamber, mortuary, &c. It has accommodation for about thirty patients.

Leicester and Leicestershire Society of Architects.—The report of the Council for 1901-2 gives the membership as 104, an increase of four during the year. The most extensive work they have undertaken has been the collection of photographs, drawings and sketches of all buildings, &c., in their county, from the eleventh to the eighteenth centuries, in which work they are co-operating with the National Trust and the Leicester Literary and Philosophical Society. The Leicester Corporation are about to provide the town with electric tramways, which will necessarily make a material alteration in the appearance of the streets, and the Council therefore made representations to the officials with regard to the design of the posts. It is believed that the Corporation will favourably consider the recommendations made. The accounts of the Society show a balance in hand of £130 13s. 6d.

The Decoration of the R.I.B.A. Premises in Conduit Street, W., will be taken in hand by Mr. G. F. Bodley, R.A.

A New Architectural Society.—The architects of Blackpool and district have decided to form a society, to be known as the Blackpool and Fylde Architectural Society. It is to be associated with the Manchester Society of Architects.

The Fifth Art Exhibition of Venice will be opened in April, 1903. A sum of one hundred thousand francs has been assigned for official purchases intended for the International Modern Art Gallery. Large gold medals will be awarded for the finest works.

The Bisley Homes.—Sir Theodore Martin again draws attention to the present condition of the homes at Bisley (see p. 141 of our issue for April 16th last), his public questions not having been replied to by the Soldiers' and Sailors' Help Society.

Bells Restored.—The fine peal of eight bells in Wooburn parish church, Bucks, is to be restored at a cost of £300. The bells are of very ancient date, and tradition connects one of them with a John Godwin, who in 1488 left 20s. for "ye making of a bell" and £5 towards the repair of the "steepult of Oboarne; Denncourt."

University College, Liverpool.—The last meeting of the session of the Latin Society was held on Wednesday last in the Engineering Theatre, when Professor Simpson delivered a lecture on Roman architecture, in the course of which he said that had the Romans been endowed with the artistic spirit of the Greeks their buildings would have been the finest in the world.

Blackfriars Bridge.—Robert Milne, the architect of Blackfriars Bridge, died on May, 5th 1811. His uncle designed the North Bridge of Edinburgh. His father was an architect also, and his grandfather designed Holyrood Palace. The uncle of this palace-builder was in the same profession, and he, John Mylne, is described on his tombstone at Greyfriars, Edinburgh, as the last of six generations of "master-masons" to the kings of Scotland.

A New Theatre at Burton-on-Trant is being erected in George Street. It is planned on the two-tier system, and whilst having all its advantages with regard to easy rake of circles, will present the appearance of a three-tier house. The entrance to the better parts will be in George Street. The architects are Messrs. Essex, Nicol & Goodman, the designers of the Grand Theatre, Birmingham, the Opera House, Coventry, &c.

Shakespeare's Birthplace.—The trustees and guardians of Shakespeare's birthplace held their annual meeting recently. The committee's report stated that more than 30,000 persons had paid for admission to the birthplace during the year, while nearly 15,000 had visited Anne Hathaway's cottage. The work of photographing the walls and ceilings of Shakespeare's birth-room in order to preserve the memorials of visitors to the place had been successfully carried out.

The History of Westminster Cathedral.—Father Herbert Lucas, S.J., M.A., has had in preparation for some considerable time past a volume entitled "The Westminster Cathedral and the History and Principles of Ecclesiastical Architecture," to be published by Sands & Co. The work, which will contain about 200 illustrations, will embody the results of a comparative study of the constructive principles involved in the various styles of ecclesiastical architecture, early Roman and Romanesque, Norman and Gothic, Byzantine and Renaissance, and will set forth a reasoned estimate of their respective advantages.

The Hellenic Society held a general meeting at Burlington House last Tuesday week, Sir Richard Jebb, M.P., presiding. There were also present Sir H. Howarth, Mr. D. G. Hogarth, Prof. Ernest Gardner and Mr. Talfourd Ely. Mr. G. F. Hill read a paper, illustrated by lantern slides, on some of the more remarkable Greek coins acquired by the British Museum during the past five years. The following have been elected members of the Society:—Lord Lansdowne, Mr. Cyril Bailey, Mr. C. C. Edgar, Mr. J. Brown, Mr. B. B. Rogers, Mr. G. A. Wathen, Mr. G. Gurney, Mr. H. Prothero, Miss G. Hirst, Miss F. Kensington, Mr. C. H. Tyler, Mr. J. W. Sherwell, Miss E. T. Minton and Mr. A. R. Keith.

A New Royal Dockyard Orphan Asylum at Devonport is being erected in Milehouse Road. Mr. H. J. Snell, of Plymouth, is the architect. It affords accommodation for twenty-five boys and the same number of girls. Mr. S. Roberts, of Plymouth, is the contractor, his tender amounting to £4,000.

A New Chancel Screen at Longstock Church has been erected. It is of oak, and is of the lightest description consistent with strength, so that it hardly hides any part of the chancel. The base is of panelling 2ft. 10in. high, which is freely pierced. From the base rise six octagonal pillars with richly-carved capitals, from which spring the arches, five in number, the centre arch being 4ft. 9in. in width. The upper part of the screen is highly decorated with carving in the spandrels, which is repeated on the east as well as on the west side of the screen. The design was composed by Messrs. Harry Hems & Sons, of Exeter, from plans of the late William White, F.S.A., who was the architect of the church.

South Cliff Congregational Church, Lowestoft, is now being erected. It consists of nave and double transepts, the latter being at present only erected projecting a few feet; these, however, can at any time, when extension is found necessary, be extended or increased in depth so as to provide considerably larger accommodation (about 180 extra). The facings are of red bricks, and the dressings of white Costessey stonework. The roofs are open timber construction of the hammer-beam type. The seating is to be of oak. A square tower with angular pilasters and terminating with a lead-covered spirelet forms a feature of the design. The contract is let to Mr. John Ashby, "Woodbury," Lowestoft, and amounts to £1,698. The accommodation of the building will be for about 430 adults. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, London, W.C.

New Companies.

Wilkinson's Sawmills Co., Ltd.

Registered to carry on the business of timber merchants in all its branches and the business of general storekeepers. Capital £1,000 in £1 shares.

Hood & Robertson, Ltd.

Registered to acquire and carry on the existing business of wholesale and retail ironmongers. Capital £15,000 in £1 shares. Registered office: 31, Crossgate, Cupar.

F. W. Breakspear & Sons, Ltd.

Registered to carry on the general business of plumbers and painters and house decorators. Capital £1,000 in £1 shares. Registered office: 28, Soho Hill, Handsworth.

Electro-Voelker Syndicate, Ltd.

Registered to acquire on business as sanitary and electrical engineers, gasfitters and dealers in all appliances used in connection therewith. Capital £5,000 in £1 shares.

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Registered to enter into a lease with the Greenock Harbour Trust of ground for the purposes of a sawmill and timber yard, and to carry on the business of sawmills and timber merchants and importers. Capital £10,000 in £1 shares (8,000 ordinary and 2,000 founders).

Richardson's Brick and Tile Co., Ltd.

Registered to acquire the business of brick-makers as now carried on at Danbury, Essex; to erect factories, workshops, warehouses, kilns, machinery, &c. Capital £5,000 in £1 shares. Registered office: Slough House, Danbury, Essex.

British Lead Syndicate, Ltd.

Registered to acquire certain patents for improvements in manufacture of lead pigments, and to carry on the business of white lead manufacturers, &c. Capital £30,000 in £1 shares. Registered office: 107, West Regent Street, Glasgow.

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
May 15	Blaengarw—Chapel	English Calvinistic Methodists	Mr. Hargest, Strand, Blaengarw.
" 15	Brentwood—Twenty-nine Workmen's Cottages	Urban District Council	Surveyor, Town Hall, Brentwood.
" 15	Halifax—Theatre .. .. .	.. .. .	R. Horsfall & Son, 22A Commercial Street, Halifax.
" 15	Coventry—Removable Floor to Baths	Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 15	London, S.W.—Carpenter's and Joiner's Work	Admiralty	Director of Navy Contracts, Admiralty, S.W.
" 15	Birmingham—Workhouse Block	Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
" 15	Huddersfield—Clothing Establishment .. .. .	.. .. .	J. Kirk & Sons, Architects, Huddersfield.
" 15	London, S.E.—Lunatic Wards at Workhouse	St. Olave's Union Guardians	Newman & Newman, 31 Tooley Street, S.E.
" 15	Abertridwr, Wales—Two Houses .. .. .	.. .. .	T. Jones, 117 Trehafod Road, Hafod, Pontypridd.
" 15	Bridlington—Residence	F. Creaser	J. Earnshaw, Architect, Carlton House, Bridlington.
" 15	Falkirk, Scotland—Electric Light Station	Town Council	D. Ronald, Borough Engineer, Burgh Chambers, Falkirk.
" 15	Tipton—Greenhouse, Tool House, Stable, &c.	Park Committee	W. H. Jukes, Surveyor, Public Offices, Owen Street, Tipton.
" 16	Cefn, Wales—House and Shop	Mr. Bowen	J. W. Hughes, Architect, Dee Harst, Llangollen.
" 16	Exwick, Exeter—Three Houses	Sir Redvers Buller	E. H. Harbottle & Sons, Architects, County Chambers, Exeter.
" 16	Southampton—Filters, &c.	Corporation	Waterworks Engineer, 18 French Street, Southampton.
" 16	Tir Phil, Wales—Five Shops .. .. .	.. .. .	P. V. Jones, Architect, Hengoed.
" 16	Greenwich—Alterations and Repairs to Lecture Hall	Borough Council	F. S. Robinson, Town Clerk, Town Hall, Greenwich Rd., Greenwich.
" 17	Horley, Surrey—Gatehouse, Lodge and Four Cottages	London County Council	Architect's Department, General Section, Spring Gardens, W.
" 17	Dunleer, Ireland—Temperance Hall .. .. .	.. .. .	J. F. McGahon, Architect, Dundalk.
" 17	Shotton Colliery, Durham—Colliery Houses .. .. .	.. .. .	Horden Collieries, Ltd., Shotton Colliery, Castle Eden, E.S.O.
" 17	Wick and Lybster—Station Offices, Houses, Sheds, &c.	Highland Railway Company	W. Roberts, Company's Engineer-in-Chief, Inverness.
" 17	Ton, Pentre, Rhondda Valley—Forty-one Houses	Industrial Co-operative Soc. Ltd.	W. D. Morgan, Architect, Victoria Chbs, Pentre, Rhondda Valley.
" 17	Bedale, Yorks—Two Semi-detached Villas .. .. .	.. .. .	H. G. E. Merrin, South End, Bedale.
" 17	Midleton—Sixty-seven Labourers' Cottages, &c.	Rural District Council	R. Evans, 53 South Wall, Cork.
" 19	Welshpool—Retort House Addition	Gas Co., Ltd.	R. Owen, Secretary, Gas Company, Welshpool.
" 19	Donaghadee, Ireland—Two Houses .. .. .	.. .. .	W. J. Fennell, 2 Wellington Place, Belfast.
" 19	Donaghadee, Ireland—Villa .. .. .	.. .. .	W. J. Fennell, 2 Wellington Place, Belfast.
" 19	Dublin—Lecture Rooms at Training College .. .. .	.. .. .	J. F. Fuller, 179 Great Brunswick Street, Dublin.
" 19	Keighley—Laundry, House and Stabling .. .. .	.. .. .	H. Smith, Architect, Compton Buildings, Keighley.
" 20	Bocconoc, Cornwall—Additions to School	J. B. Fortescue	W. Pease, Solicitor, Lostwithiel.
" 20	Cheltenham—Park Chalet	Corporation	Borough Surveyor, Municipal Offices, Cheltenham.
" 20	Ynysybwl, Wales—Workmen's Institute .. .. .	.. .. .	J. Rees, Architect, Pentre.
" 20	Lanner, near Redruth—Sunday School .. .. .	.. .. .	H. W. Collins, Architect, Walreddon, Redruth.
" 20	Egremont, Cheshire—Conveniences and Shelters	Wallasey Urban District Council	W. H. Travers, Engineer, Public Offices, Egremont.
" 21	Compton Dundon—Dwelling House .. .. .	.. .. .	Mr. Swatridge, Compton Dundon, Somerset.
" 21	Coppull—Wesleyan Chapel .. .. .	.. .. .	W. H. Dinsley, 12 Cleveland Street, Chorley.
" 21	Bootle—Alterations, &c., to Drill Shed, &c.	Corporation	Borough Engineer, Bootle.
" 21	Beverley—Extension of Lunatic Asylum .. .. .	.. .. .	C. H. Hebblethwaite, 10 Waterhouse Street, Halifax.
" 21	Nelson, Lancs—Car Shed	Electricity and Tramways Committee	R. Ball, Borough Engineer, Town Hall, Nelson.
" 21	Resolven, Wales—Vestry, Classrooms, &c. .. .. .	.. .. .	J. O. Rees, Architect, Neath.
" 22	London—Renewing Hospital Floor	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 22	Leeds—Baths and Library	Corporation	H. A. Chapman, Architect, Prudential Buildings, Park Row, Leeds.
" 22	Portmadoc, Wales—Alterations, &c., to Market Hall	Ynysybwl Urban District Council	M. Thomas, Surveyor, Council Office, Portmadoc.
" 22	Whitby, Yorks—Dwelling, Fog Signal House, &c.	Trinity House	Corderoy, Selby & Corderoy, 21 Queen Anne's Gate, Westminster.
" 22	Charmminster—House for Private Patients at Asylum .. .. .	.. .. .	G. T. Hine, 35 Parliament Street, S.W.
" 22	Waltham, Pembrokeshire—Memorial Hall .. .. .	.. .. .	W. Buck, Architect, Horsham.
" 23	Brentwood—Retort House, Coal Store, Boiler House	Gas, Coke and Light Co., Ltd.	R. M. Couper, 3 Queen's Road, Brentwood.
" 23	Bristol—Store-rooms at Workhouse	Guardians	J. J. Simpson, Clerk, St. Peter's Hospital, Bristol.
" 23	Lowestoft—Schools	School Board	R. Beattie-Nicholson, 115 High Street, Lowestoft.
" 24	Bargoed, Wales—Altering, &c., Hotel .. .. .	.. .. .	A. O. Evans, Architect, Pontypridd.
" 26	Walthamstow—Classrooms, &c.	School Board	H. Prosser, Architect, School Board Offices, High St., Walthamstow.
" 26	Axbridge, Somerset—Infirmary	Board of Guardians	A. Powell, 3 Unity Street, College Green, Bristol.
" 26	Higham—Classrooms and Cloakrooms	Walthamstow School Board	H. Prosser, Architect, Sch. Bd. Offices, High Street, Walthamstow.
" 26	Cannock—Alterations, &c., to Schools	School Board	Bailey & McConnel, Architects, Bridge Street, Walsall.
" 26	Ashton under-Lyne—Hospital and Administrative Block, &c.	Guardians	J. Eaton, Sons & Cantrell, Stamford Street, Ashton-under-Lyne.
" 26	London, S.E.—Covered Play-Shed, Tar Paving, &c.	Metropolitan Asylums Board	T. D. Mann, Board's Offices, Embankment, E.C.
" 27	Manchester—Electric Car Shed and Offices	Corporation	J. M. McElroy, 55 Piccadilly, Manchester.
" 27	Winchester—Conveniences	Corporation	City Surveyor, Guildhall, Winchester.
" 27	Old Trafford, Manchester—Public Baths	Stretford Urban District Council	E. Woodhouse, 88 Mosley Street, Manchester.
" 28	Thorpe, co. Durham—Additions to Hospital	Easington Rural District Council	Farthing & Dunn, 21 Pilgrim Street, Newcastle-on-Tyne.
" 28	Bruton, Somerset—Laboratory and Classrooms	Governors of King's School	A. J. Pictor, Architect, Bruton, Somerset.
" 29	Merthyr, Wales—Fifty-three Cottages	Saxon Building Club	P. V. Jones, Architect, Hengoed.
" 29	West Hartlepool—Hospital Building	Corporation	Borough Engineer, West Hartlepool.
" 30	Gellifaelog, Pembrokeshire, near Merthyr—15 Villas	Penybryn Villa Club	W. Dowdeswell, Architect, Trebarri.
" 31	Chelmsford—Underpinning Asylum Chapel	Essex County Lunatic Asylum	F. Whitmore, 17 Duke Street, Chelmsford.
" 31	Brentwood, Essex—Underpinning Chapel .. .. .	.. .. .	F. Whitmore, 17 Duke Street, Chelmsford.
" 2	Boston, Lines—Additions, &c., to Hospital	Urban District Council	J. Rowell, Architect, Borough Offices, Boston.
" 2	Boston—Hospital Ward	Urban District Council	J. Rowell, Architect, Borough Offices, Boston.
" 2	Birmingham—Foundations and Lower Storey of University Buildings	University	Aston Webb & E. Ingress Bell, 19 Queen Anne's Gate, S.W.
" 4	Epping—Infants' School	School Board	Harrington & Ley, 65 Bishopsgate Street Without, E.C.
" 9	Pentre, Wales—School	Ystradgynodwg School Board	J. Rees, Architect, Hillside Cottage, Pentre.
" 14	Castlebar—Extensions to Asylum .. .. .	.. .. .	J. T. Kelly, Clerk, Lunatic Asylum, Castlebar.
No date.	Aspull—Four Dwelling House .. .. .	.. .. .	R. Flemming, 20 Clifton Street, Wigan.
ENGINEERING:			
May 15	Dewsbury—Laundry Machinery, &c.	Joint Hospital Board	Holton & Fox, Architects, Dewsbury.
" 15	Louth—Dredging Canal .. .. .	.. .. .	P. Allison, Clerk, Louth.
" 15	Dewsbury—Lorry	Guardians	J. Peace, Clerk, Wellington Street, Dewsbury.
" 16	Egremont, Cheshire—Gas and Electric Stores	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 16	Lydney, Glos—Pumping Plant	Rural District Council	J. F. Trew, Engineer, County Chambers, Station Rd., Gloucester.
" 17	Maldon, Essex—Well Reconstruction	Rural District Council	H. G. Keywood, Engineer, Public Hall Chambers, Maldon.
" 17	Yeovil—Cast-iron Water Mains	Rural District Council	J. E. Rodder, 30 Kingston, Yeovil.
" 19	Swindon—Accumulators	Corporation	Lacey, Olirehugh & Sillar, 78 King Street, Manchester.
" 19	Rathdum, Ireland—Waterworks	Rural District Council	B. Manning, Clerk, Workhouse, Rathdum.
" 19	Wedmore, Weston-Super-Mare—Bridge	Somersetshire Drainage Commissioners	W. Lunn, Engineer, Commissioners' Office, Queen St., Bridgewater.
" 20	Bury, Lancs—Jet Condenser and Pumps	Electricity Committee	S. J. Watson, Engineer, Electricity Works, Bury.
" 20	Salford, Cokes—Conveying Machinery, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
" 21	Stockport—Water-Lube Boiler	Gas and Electricity Committee	S. Meunier, Gas and Electricity Office, Portwood, Stockport.
" 21	Watford—Outfall Sewer	Rural District Council	E. Lailey, 9, Market Street, Watford.
" 21	Watford—Main Sewer Extension	Rural District Council	E. Lailey, 9, Market Street, Watford.
" 21	Exeter—Septic Tanks, Filters, &c.	Town Council	City Surveyor, Exeter.
" 21	Rhyl—Waterworks	Urban District Council	L. G. Hall, Engineer, Paradise Street, Rhyl.
" 21	Darlington—Gas-holder	Corporation	Gas Engineer, Gasworks, Darlington.
" 22	Nelson—Reservoir	Corporation	Water Manager, Town Hall, Nelson.
" 23	Southwold, Suffolk—Repairing, &c., Pier	Corporation	Borough Surveyor, Town Hall, Southwold.
" 24	Belper—Sewers	Rural District Council	R. C. Oordon, Engineer, Hazelwood, near Derby.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
May 24	Leeds—Cast-iron Water Cistern at Gasworks	Corporation	R. H. Townsley, General Manager, Gas Offices, Leeds.
" 27	Old Trafford, Manchester—General Engineering, Boilers, &c., at Baths.	Stretford Urban District Council	E. Woodhouse, 88 Mosley Street, Manchester.
" 27	London, N.W.—Hot-water Supply, Heating and Laundry Apparatus.	Willesden District Council	O. C. Robson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
" 28	Ausdell, near Lytham—Roads, Bridge, Station, Warehouse, &c.	Lancs & Yorks & N.W. Railways	Engineer's Office, L. & Y. Railway, Hunt's Bank, Manchester.
" 31	Southampton—Dredging	Harbour Board	W. Bowyer, Clerk, Town Quay, Southampton.
" 31	Bridgend, Glamorgan—Electric Wiring and Fittings	Committee of County Asylums	W. E. R. Allen, Clerk, Glamorgan County Offices, Cardiff.
" 31	Littlehampton—Water-Mains	Urban District Council	H. Howard, Surveyor, Town Offices, Littlehampton.
June 2	Alexandria, Egypt—Beacon Buoys, &c.	Ports and Lighthouses Administration	Controller-General, Ports and Lighthouses, Alexandria.
" 2	Swansea—Refuse destructor	Administration of Ports and Lighthouses	G. Bell, Borough Surveyor, Guildhall, Swansea.
" 2	Alexandria, Egypt—Gas Beacons, &c.	Blackwell Rural District Council	Office of Ports and Lighthouses Administration, Alexandria.
" 3	Pleasley, Mansfield—Waterworks	Corporation	G. & F. W. Hodson, Engineers, Loughborough.
" 11	Calcutta—Sand Washers	Corporation	Engineer, Municipal Office, Calcutta.
" 12	Harrogate—Light Railway	Corporation	E. W. Dixon, 14 Albert Street, Harrogate.
" 16	Newport, Mon.—Transporter Bridge	Corporation	Borough Engineer, Town Hall, Newport.
FURNITURE:			
May 17	Nottingham—Furniture for Workhouse	Guardians	G. M. Howard, Clerk, Poor-Law Offices, Shakespeare St., Nottingham
" 21	Burnley—Furniture, &c., Workhouse Extensions	Guardians	Master, Workhouse, Burnley.
IRON AND STEEL:			
May 15	Rochester—Cast-iron Socket Pipes, &c.	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
" 15	Leeds—Cast-iron Pipes	Corporation	City Engineer, Leeds.
" 15	Egremont, Cheshire—Iron and Steel, Lamp Columns.	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 17	Macclesfield—Cast-iron Mains, Steam Tubes, &c.	Gas Committee	Engineer, Gasworks, Macclesfield.
" 17	Edinburgh—Pipework	Lord Provost, Magistrates and Council	Electrical Engineer, Electricity Supply Stn., Dewar Pl., Edinburgh.
" 19	Pontypridd—Cast-iron Mains	Urban District Council	E. Jones, Gas Engineer, Treforest.
" 19	Dundee—Sluice Valves, Castings, &c.	Water Commissioners	G. Baxter, 93 Commercial Street, Dundee.
" 21	Nelson, Lancs—Steelwork	Plans and Buildings Committee	B. Ball, Borough Engineer, Town Hall, Nelson.
June 9	Brighton—Points, Crossings, &c.	Town Council	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.
" 9	Brighton—Tramrails	Town Council	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.
PAINTING AND PLUMBING:			
May 15	Egremont, Cheshire—Oils and Paints	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 15	Bootle, Lancs—Painting Gas Lamp Columns	Corporation	Electrical Engineer, Pine Grove, Bootle, Lancs.
" 15	Prestwich, Lancs—Painting at Asylum	Corporation	Superintendent, County Asylum, Prestwich.
" 15	London—Cleaning & Painting Roof at St. Pancras Stn.	Midland Railway	Engineer, Derby Station.
" 17	Wigan—Cleaning, Painting, &c., Houses, &c.	Corporation	Borough Engineer, Rodney Street, Wigan.
" 17	Macclesfield—Oils, Paints, &c.	Gas Company	Engineer, Gasworks, Macclesfield.
" 21	London, S.W.—Painting, &c., at Infirmary	St. George's Union Guardians	W. H. Chappell, Clerk of Works, Infirmary, Fulham Road, S.W.
ROADS AND CARTAGE:			
May 15	Leeds—Tar Macadam	Corporation	City Engineer, Leeds.
" 15	Glasgow—Paving Work	Corporation	Office of Public Works, City Chambers, 64 Cochrane St., Glasgow.
" 15	Inverness—Road Repair, &c.	County Council	O. J. M. Mackintosh, District Road Surveyor, Fort William.
" 15	Poole—Granite	Town Council	J. Elford, Borough Engineer, Poole.
" 15	Epsom—Materials and Cartage	Rural District Council	T. E. Ware, Surveyor, Waterloo Road, Epsom.
" 15	Hawarden—Roadstones	Rural District Council	W. Newton, District Surveyor, Buckley, Chester.
" 15	London—Granite	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green.
" 16	Middlesbrough—Road Materials, &c.	Bethnal Green Borough Council	B. Wintersgill, 42 Commercial Street, Middlesbrough.
" 16	Newmarket—Making-up, Kerbing, &c.	Stores Committee	O. E. Griffiths, Estate Agent, Rothsay House, Newmarket.
" 16	Castle Donington—Materials, &c.	Rural District Council	F. E. Burton, Clerk, High Street, Castle Donington.
" 17	Romsey—Flints	Corporation	Borough Surveyor, Market Place, Romsey.
" 17	Macclesfield—Carting	Gas Committee	Engineer, Gasworks, Macclesfield.
" 17	Droitwich—Stone	Corporation	H. Hulse, Borough Surveyor, Droitwich.
" 17	Egremont, Cheshire—Gravel	Wallasey Urban District Council	W. H. Travers, District Surveyor, Public Offices, Egremont.
" 19	Warrington—Woopaving Works	Paving and Sewerage Committee	Borough Surveyor, Town Hall, Warrington.
" 20	Desborough, Northants—Granite	Urban District Council	D. J. Diver, Surveyor, Desborough.
" 21	Haywards Heath, Sussex—Materials	Cuckfield Urban District Council	T. Simmons, Surveyor, Cuckfield.
" 21	London, W.—Road	Corporation	Brown & Foulkes, Surveyors, Tring.
" 21	Nelson, Lancs—Granite Setts	Corporation	B. Ball, Borough Surveyor, Town Hall, Nelson.
" 21	Kingston-on-Thames—Paving, Sewering, Levelling, &c.	Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames.
" 22	Hoyland, near Barnsley—Street Improvements, &c.	Urban District Council	W. P. Young, Surveyor, Town Hall, Hoyland, near Barnsley.
" 22	Sudbury, Suffolk—Granite	Melford Rural District Council	W. Carver, Surveyor, Crownwell Villas, Suffolk Road, Sudbury.
" 23	Brighton—Kerb and Channel	Town Council	F. J. C. May, Borough Surveyor, Town Hall, Brighton.
" 23	Brighton—Granite Kerb and Channel	Corporation	F. J. C. May, Borough Surveyor, Town Hall, Brighton.
" 26	London, E.—Tar paving Playgrounds	East Ham School Board	R. L. Ourtis, 120 London Wall, Moorgate Street, E.C.
SANITARY:			
May 15	Ermington, Devon—Sewerage	Plympton St. Mary R.D.O.	F. A. Clark, New Town Chambers, Old Town Street, Plymouth.
" 17	Macclesfield—Lime	Gas Committee	Engineer, Gasworks, Macclesfield.
" 19	Penrith, Cumberland—Sewerage Works	Rural District Council	J. Graham, Engineer, Bank Chambers, Bank Street, Carlisle.
" 19	Culgaith, Penrith—Sewerage Works	Rural District Council	J. Graham, Engineer, Bank Chambers, Bank Street, Carlisle.
" 19	St. Annes-on-Sea, Lancs—Sewer, &c.	Urban District Council	G. Hodgkinson, Surveyor, Council Offices, St. Annes-on-Sea.
" 21	Watford—Outfall Sewer	Rural District Council	E. Lailey, 9 Market Street, Watford.
" 21	Watford—Main Sewer Extension	Rural District Council	E. Lailey, 9 Market Street, Watford.
" 22	Birkenhead—Lime	Corporation	T. O. Patterson, Gas Engineer, Town Hall, Birkenhead.
" 27	Burton-on-Trent—Lime	Gas and Electric Light Committee	F. L. Ramsden, Mgr., Gas & Electric Light Wks., Burton-on-Trent.
" 27	New Mill, near Huddersfield—Sewerage and Sewage-disposal Works.	Urban District Council	O. H. Marriott, Son & Shaw, Engineers, Council Offices, New Mill, near Huddersfield.
" 27	Plymouth—Sewerage Works	Corporation	J. Mansergh & Sons, 5 Victoria Street, Westminster.
" 28	Audenshaw, Lancs—Sewers	Urban District Council	J. P. Wilkinson, 47 Arcade Chambers, St. Mary's Gate, Manchester.
TIMBER:			
June 9	London, W.C.—Firewood	London School Board	Contracts Sub-Depart., School Bd. Offices, Victoria Embankment, W.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May 15	Abergavenny—Names of Architects for Workhouse	(Monm. Architects only.)	W. H. P. Scanlon, Clerk to Guardians, Town Hall, Abergavenny.
" 31	Sedgfield—Infectious Diseases Hospital	£0.	W. Snowdon, Surveyor, Council Office, Sedgfield.
June 1	Knaresborough—Infectious Disease Hospital	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 12	Crewes—Municipal Office and Council-Chamber	£50, £25.	Borough Surveyor, Municipal Offices, Crewes.
" 16	Hartshill, Stoke-on-Trent Nurses Home	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 22	Rhymney—Cottage Hospital	—	B. Jones, 29 Plantation Street, Rhymney.
" 27	West Hartlepool—School	£75, £35.	J. B. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
July 15	London, N.—Municipal Buildings	£200, £100, £50.	W. H. Prescott, Engineer, U.D.C. Offices, Tottenham.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
Sept. 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprava, St. Petersburg.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRENTFORD (NOTTS).—For the erection of six dwelling houses, King Street. Mr. Fred C. Martin, architect, Nottingham:—
E. Spray £1,278
E. Ascroft 1,200
A. Cantt. 1,170
T. H. Harper, * Carlton 1,125
* Accepted.

BRENTFORD (NOTTS).—For the erection of schools, Ealing Road, for the Old Brentford Board School. Messrs. Nowell Parr and A. E. Kates, architects, 5 Brent Road, Brentford, W.:—

Kellett & Sons, Ltd.	£14,911 0 0
J. W. Brooking	13,140 0 0
Harker & Co.	12,650 0 0
Foster Bros.	12,638 0 0
Parsons & Co.	12,553 0 0
R. L. Tongue	12,490 0 0
Soule & Son	12,454 0 0
Godson & Son	12,390 0 0
F. & E. Davey	12,200 0 0
Chessum & Son	12,054 0 0
W. Wisdom	12,051 8 4
R. M. Hughes	11,974 0 0
H. F. Nightingale	11,933 0 0
F. G. Minter	11,907 0 0
E. Chamberlain	11,768 0 0
W. Blackburn	11,671 0 0
Gaze & Son	11,594 0 0
Gough & Co., * Hendon	11,534 0 0
Draide, Pater, & Co.	11,408 0 0

[Architect's estimate £11,820.]

BROMLEY (KENT).—Accepted for alterations and additions to private residence. Mr. G. St. Pierre Harris, architect, 8 Ironmonger Lane, E.C.:—
T. D. Grady £281
[No competition.]

CARDIFF.—For the erection of the church of All Saints, Windsor Road, Cardiff. Messrs. Seddon and Carter, architects, Bank Buildings, St. Mary Street, Cardiff:—

E. Turner & Sons	£2,288 0 0
C. C. Dunn	2,275 0 0
J. Allan	2,247 8 0
S. Shepton & Sons	2,245 0 0
A. Berridge	2,212 0 0
Price Bros.	2,157 0 0
Knox & Wells	2,100 0 0
Cox & Bardo	2,018 0 0
E. R. Evans Bros., * Gwyneth Street	1,940 0 0

* Accepted. [All of Cardiff.]

CARDIFF.—For enlarging St. John's Parish Church, Canton, Cardiff, for the Rev. D. Davies, rector, and Committee. Mr. Geo. F. Halliday, F.R.I.B.A., architect, Cardiff. Quantities by Mr. John W. Rodger, 14 High Street, Cardiff:—

Lattley & Co., Ltd., Roath	£2,871 15 2
A. W. Cadwallader	2,770 0 0
J. Blight	2,705 0 0
G. Couzens & Co.	2,700 0 0
S. Shepton & Sons	2,675 3 0
F. Couzens	2,500 0 0
C. Beames & Nephew	2,480 0 0
W. T. Morgan	2,445 0 0
C. C. Dunn	2,315 0 0
Knox & Wells, * Bangor Street	2,303 0 0

* Accepted. [Rest of Cardiff.]

CHERRYHINTON (NEAR CAMBRIDGE).—For the forming and making of about 33 miles of roads and paths in the parish of Cherryhinton, near Cambridge, for the Chesterton Rural District Council. Messrs. Waters and Worrall, engineers, 2 Sidney Street, Cambridge:—

Holton Bros., Cambridge	£14,800 0 0
Swann Bros., Cambridge	14,000 10 8
Ford, Harlesden	13,478 0 0
Coulson & Lotts, Cambridge	13,256 0 0

Truman, Swanley, Kent	12,345 0 0
Wallace & Inns, Hitchin	11,152 10 9
W. Jones & Sons, * Neath and Cherryhinton, Cambs	10,461 5 6
Saunders & Saunders, Birmingham	7,967 13 0

* Accepted.

FAWKHAM (KENT).—For the erection of two cottages. Mr. G. St. Pierre Harris, architect, Ironmonger Lane, E.C.:—
A. W. Martin £301 C. S. Lucas £498
F. R. Thorne 725 R. W. Gilham* 475
S. Jessup 630
* Accepted.

FRIMLEY (SURREY).—For the erection of a sanatorium for consumptives, for the Brompton Consumption Hospital. Mr. Edwin T. Hall, architect, 54 Bedford Square, London, W.C.:—

Higgs & Hill	£20,450 0
W. Watson	18,183 0
Foster & Dickson	11,103 0
Haslemere Builders	58,622 12
Laurence & Son	57,362 0
Leslie & Co.	57,250 0
Shillito & Son	57,000 0
Holliday & Greenwood*	55,255 0

* Accepted.
HULL.—For the erection of a junior department in connection with the Paisley Street Board School, for the Kingston-upon-Hull School Board:—

Hockney & Liggins	£3,693 0 0
G. Jackson & Sons	3,675 0 0
G. Houlton	3,582 0 0

A. £82 0
12 10
25 0

F. Beilly	3,575 0 0
G. H. Scorer	3,550 0 0
J. H. Fenwick	3,520 0 0
J. Simpson & Son	3,484 0 0
M. Harper*	3,332 15 11

* Accepted. A. Add for golden brown bricks. [All of Hull.]
ISLEWORTH.—For constructing roadways at their new work house, Isleworth, for the Guardians of Brentford Union:—

Felkin	£3,841 0
Soame	3,225 6
Macklin	3,106 0
Patler	3,100 3
Swaker	3,000 0
Adams	2,905 0
Dorey & Co.	2,640 0
Wheeler	2,515 0
Ford	2,398 0
Ballard*	2,227 0

* Accepted.
KINGSBURY (MIDDLESEX).—For sewerage works, for the Kingsbury Urban District Council—Contract No. 1. Mr. S. Slater Grimley, C.E., consulting engineer, The Boroughs, Hendon:—

Wrags' or Sutton's Pipes of a Thickness of One-tenth of the Internal Diameter.	
Meston & Hale, 43 Tubb's Road, Harlesden	£9,481 10 7
R. Ballard, Ltd., Child's Hill, N.W.	9,069 0 0
T. Adams, Wood Green, N.	9,031 13 3
J. Dickson, Townsend, St. Albans	9,037 17 10
C. W. Killingback & Co., James Street, Camden Town	8,302 11 2

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PHOTOGRAPH OF BASEMENT lighted with ORDINARY GLASS.

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From 3in. to 20in. deep.

J. Jackson, Broadway, Plaistow, E. ...	7,828 18 7
C. Ford, Harlesden, N.W. ...	7,097 0 0
J. A. Dunmore, 70 Crouch Hill Road, N. ...	7,188 17 10
W. G. Green & Co., Walton Street, Aylesbury ...	7,093 0 0

Hamblett's Ironware Pipes.	
Meston & Hale ...	£9,253 0 4
R. Ballard, Ltd. ...	8,947 0 0
T. Adams ...	8,892 12 3
J. Dickson ...	8,793 10 4
C. W. Killingback & Co. ...	8,044 7 11
J. Jackson ...	7,653 10 1
C. Ford ...	7,532 0 0
J. A. Dunmore ...	7,030 4 9
W. G. Green & Co. ...	6,930 10 0

Wraggs or Sutton's Pipes of a Thickness of One-twelfth of the Internal Diameter.

Meston & Hale ...	£9,253 0 4
R. Ballard, Ltd. ...	8,907 0 0
T. Adams ...	8,852 12 3
J. Dickson ...	8,793 10 4
C. W. Killingback & Co. ...	8,044 7 11
J. Jackson ...	7,653 10 1
C. Ford ...	7,532 0 0
J. A. Dunmore ...	7,030 4 9
W. G. Green & Co. ...	6,977 10 0

LEAVESDEN (HERTS.).—For the erection at Leavesden Asylum of a boot-room and a building comprising a hair-picking room, and accommodation for a steam disinfecter, for the Metropolitan Asylums Board.—

Building work.	
S. W. Moscrip, Willesden Junction ...	£2,061 1 11
J. Payne, Hemel Hempstead ...	1,961 0 0
E. Wall, Lower Tooting ...	1,961 0 0
Clark Bros., Watford (first tender, £1,873 18s. 4d.) ...	1,867 10 8
H. B. Watkins, Watford ...	1,791 0 0
Gardner & Hazell, Islington, N. ...	1,733 12 0
Dupont & Co., Watford (first tender, £1,842 4s. 6d.) ...	1,740 10 7
Tyler & White, Watford ...	1,712 15 2
G. Wiggs, Watford ...	1,692 0 0
R. L. Tonge,* Watford ...	1,620 0 0

Engineering work.	
R. Clarke, Featherstone Street, E.C. ...	551 0 0
C. Esson, Fetter Lane, E.C. ...	545 0 0
Williams & Sons, Cardiff ...	400 0 0

Thomas & Taylor, Ltd., London, N. ...	450 0 0
Reed & Sons, Ltd., Brighton ...	445 0 0
R. A. Crowe, Manchester ...	402 15 0
Brightside Foundry and Engineering Company, Ltd., Victoria Street, Westminster, S.W. ...	387 0 0
Fairbrother & Co., Fann Street, E.C. ...	347 0 0
Greenwood & Co., Dobcross, near Oldham ...	340 0 0
Herring & Son, Chertsey ...	320 0 0
Haden & Sons, Trowbridge ...	318 0 0
Crittall & Co., Noel Street, W. ...	313 0 0
Beaven & Sons, Victoria Street, Westminster, S.W. ...	279 15 0
Paragon Heating Co., Birmingham ...	279 0 0
Joel & Potter United, Ltd., South Molton Street, W. ...	260 0 0
Dawson & Co., Ltd., Stalybridge ...	260 0 0
J. & F. May, London, W.C. ...	216 0 0
Werner, Pheiderer, & Perkins, Ltd., Regent Street, W.C. ...	214 18 6
Watford Engineering Works, Watford ...	188 0 0

LEISTON.—For laying water pipes and erecting base for water tank for the Leiston Urban District Council.—

	Pipe lg.		Water tk. base.	
	£	s. d.	£	s. d.
Grinwood, Ipswich ...	1,118	0 0	465	0 0
Daniel Young, Witney ...	975	2 0	432	13 4
Burgoyne, Ipswich ...	833	13 6	504	0 0
Moran & Son, Harwich ...	795	0 2	513	0 0
Jas. Trueman, Swanley ...	753	0 0	450	0 0
Parkington & Sons, Ipswich ...	750	0 0	450	0 0
Case Sea Defence Syndicate ...	615	7 0	633	15 7
Dean, Ryde ...	594	12 6	425	2 0
Thurman, Walton Works, Felixstowe ...	550	13 6	450	0 0

LONDON.—For the erection of a special school at Haverstock Hill, for the London School Board.—

F. Gough & Co. ...	£4,204	C. Cox ...	£1,068
McCormick & Sons ...	4,245	G. S. S. Williams & Son ...	3,882
C. Deering & Son ...	4,217	E. Lawrence & Sons ...	3,841
Willmott & Sons ...	4,150	J. Simpson & Son ...	3,752
J. Grover & Son ...	4,112	Stimpson & Co. ...	3,714
L. H. & R. Roper ...	4,135	Treasure & Son ...	3,682
Marchant & Hirst ...	4,118	E. Triggs* ...	3,553
H. Wall & Co. ...	4,118		

* Recommended for acceptance.

LONDON.—For enlargement of Chisenhall Road School, for the London School Board.—	
Willmott & Sons ...	£3,725
W. Grear & Son ...	2,077
J. Chessum & Sons ...	2,051
Snewin Bros. & Co. ...	2,037
W. Shummur & Sons, Ltd. ...	2,521
C. Miskin & Sons ...	2,521
F. & F. J. Wood ...	£2,513
E. Lawrence & Sons ...	2,401
J. and M. Patrick ...	2,451
C. Cox ...	2,439
Treasure & Son,* London ...	2,387
and Shrewsbury ...	2,387

* Recommended for acceptance.

LONDON.—For the erection of a special school for mentally defective children at Mansfield Road, for the London School Board.—	
H. Wall & Co. ...	£1,450
Marchant & Hirst ...	1,441
Treasure & Son ...	1,431
General Builders, Ltd. ...	1,408
McDonnell & Sons ...	1,380
C. Cox ...	£1,375
C. Deering & Son ...	1,331
Willmott & Sons ...	1,312
G. S. S. Williams & Son ...	1,300
E. Lawrence & Sons* ...	1,270

* Recommended for acceptance.

LOWESTOFT.—For the erection of premises for the Young Men's Christian Association, Lowestoft, Mr. Herbert J. Green, architect, 31 Castle Meadow, Norwich.—

J. S. Chapman & Son, Norwich ...	£1,403 0 0
C. R. Cole, Lowestoft ...	1,370 11 0
J. S. Smith, Lakenham, Norwich ...	1,352 9 0
G. Elsey, Lowestoft ...	1,301 18 10
A. D. Boddy & Son, Norwich ...	1,275 18 6
J. Youngs & Son, Norwich ...	1,249 16 1
J. Ashby, Lowestoft ...	1,199 0 0

MACROOM (IRELAND).—For the erection of a town hall for the Urban Council.—

P. Murphy, John Street, Cork ...	£2,200
T. Buckley, Cork ...	1,800
J. Ring, Macroom ...	1,700
D. Murphy, Dumanaway ...	1,490

No tender accepted.

MAESYCWMMER (WALES).—For the erection of 20 or more dwelling-houses at Maesycwmmmer, for the Gallyder Building Club, Mr. George Kenshole, architect, & Co., Station Road, Bangor.—

E. Williams, Newbridge, Mon. ...	£4,090
H. R. Paul, Bangor, Glam. ...	3,751
J. & J. Williams, Cathays, Cardiff ...	3,590
W. L. Jones, Maesycwmmmer ...	3,530
J. James & Sons, Penygraig ...	3,513
E. Edwards, Bangor, Penangam ...	3,513
W. Morris, Bangor ...	3,485
W. Williams & sons, New Treleagar ...	3,440
J. H. James,* 13 Kinnersig Street, Cardiff ...	3,440
Mills & Co., Risca, Mon. ...	3,200

* Accepted.



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NOTTINGHAM.—For erection of stationers' warehouse, Woolpack Lane, Nottingham. Mr. H. Allcock, architect, Wheeler Gate, Nottingham:—
Dennett & Ingle ... £1,400 0
J. G. Thomas ... 1,377 0
J. Shaw ... 1,285 9
F. Messon ... 1,278 0
Crane & Co., Ltd. ... 1,277 0
Williamson & Co.* ... 1,277 0
* Accepted.

ORPINGTON (KENT).—For alterations and additions to private residence. Mr. G. St. Pierre Harris, architect, 8 Ironmonger Lane, E.C. Quantities by Messrs. Stanger & Son:—
Stebbing & Fannett ... £1,203 10
J. Garrett & Sons ... 1,205 0
T. Knight ... 1,088 0
H. Somerford & Son ... 983 10
R. A. Lowe ... 974 0
T. D. Grady* ... 922 0
* Accepted with modifications.

SHEFFIELD.—For alterations and additions to 50 and 52 Sheffield Moor, Sheffield, for the Trustees of the late Jno. Spafford, Esq. Messrs. Hall & Fenton, architects, 14 St. James's Row, Sheffield. Quantities by the architects:—
Dyson, Son & Gregory, London Road South ... £2,059 10 0
J. Masson, Talbot Street ... 2,025 0 0
Ash, Son & Biggin, Furnival Street ... 2,015 0 0
F. Turner, Rockingham Street ... 1,979 0 0
J. Maston & Son, Cavendish Street ... 1,953 0 0
J. H. Lileker, Alma Street ... 1,854 10 0
C. H. Gillam, Sharrow Lane ... 1,850 0 0
T. Margerrison, Church Street, Dronfield ... 1,870 0 0
G. Portass, Heeley ... 1,810 7 0
G. Allen,* Bolsover Street ... 1,729 0 0
* Accepted.

SHEFFIELD.—For rebuilding the "Old Light Horseman" public-house, Penistone Road, Sheffield, for the Directors of Thomas Rawson & Co., Ltd. Messrs. Hall & Fenton, architects, 14 St. James's Row, Sheffield. Quantities by the architects:—
Dyson, Son & Gregory ... £1,225 0
J. Maston & Son ... 1,221 0
A. Bradbury ... 1,175 0
J. H. Lileker ... 1,171 0
Abeys & Son ... 1,144 13
F. Turner ... 1,137 12
T. Margerrison ... 1,110 0
J. Masson ... 1,074 0
E. Moore ... 1,062 0
G. Allen,* Bolsover Street ... 1,007 0
* Accepted. [All of Sheffield.]

SYDENHAM HILL, S.E.—For alterations and repairs to private residence. Mr. G. St. Pierre Harris, architect, 8 Ironmonger Lane, E.C.:—

J. Bowyer & Co. ... £684 0
Somerford & Son ... 671 0
J. H. Smith ... 623 5
F. J. Marston* ... 501 0
* Accepted.

TENDRING (ESSEX).—For carrying out and completing certain alterations and additions to the workhouse, Tendring, near Colchester, for the Guardians of Tendring Union. Mr. F. Whitmore, architect, 17 Duke Street, Chelmsford:—

Kerridge & Shaw, Cambridge ... £4,005 5 3
N. Saunders & Son, Dedham ... 3,945 0 0
F. Bennett, Ipswich ... 3,900 0 0
E. West, Chelmsford ... 3,808 0 0
G. Grimwood & Sons, Sudbury ... 3,692 0 0
H. W. Gladwell, Walton-on-Naze ... 3,590 0 0
A. Suckling, Halstead ... 3,478 0 0
F. C. Thurman, Ipswich ... 3,438 0 0
F. Dupont & Co., Colchester ... 3,375 0 0
J. McKay, Clacton-on-Sea ... 3,381 0 0
W. J. Bloxham, Banbury ... 3,272 0 0
E. Saunders, Dovercourt ... 3,218 0 0
Smith & Beaumont,* Harwich ... 3,208 0 0
* Accepted.

WIMBLEDON.—For making-up the following roads, for the Wimbledon Urban District Council—viz.: (1) Arthur Road, Section I.; (2) Arthur Road, Section II.; (3) Home Park Road, Section I. Mr. C. H. Cooper, M.I.C.E., engineer and surveyor:—

Arthur Road, Section I.
Border & Co., Seven Kings, Ilford ... £1,344
Parry & Co., Fulham ... 1,210
T. Adams & Co., Wood Green, N. ... 1,198
E. Iles, jun., North Road, South Wimbledon ... 1,011

Arthur Road, Section II.
T. Adams & Co. ... 1,083
Parry & Co. ... 1,077
Border & Co. ... 1,814
E. Iles, jun. ... 1,760

Home Park Road, Section I.
Border & Co. ... 617
Parry & Co. ... 605
T. Adams & Co. ... 591
E. Iles, jun. ... 590
* Accepted.

WINGATE.—For the erection of a new Wesleyan Methodist church and school at Wingate. Mr. H. T. Gradon, architect, Market Place, Durham:—

D. D. Hall, Gateshead ... £4,000 16 5
Watt Bros., West Hartlepool ... 3,503 18 6
G. T. Manners, Durham ... 2,980 0 0
Nicholson & Thistle, West Hartlepool ... 2,308 11 8
J. H. Milburn ... 2,181 10 0
Draper & Sons,* Leamside ... 2,100 0 0
R. Wade,* Moorsley ... 2,040 0 0
* Accepted conditionally. † Withdrawn.

COMING EVENTS.

Wednesday, May 14.

GRESHAM COLLEGE.—Professor Wagstaff on "Elementary Statics"—II., 6 p.m.
GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.
JAPAN SOCIETY.—Meeting at 20, Hanover Square, W., at 8.30 p.m.

Thursday, May 15.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.
INSTITUTION OF ELECTRICAL ENGINEERS (Meeting at Society of Arts, Adelphi)—Prof. C. A. Carus-Wilson on "Electrical Traction on Steam Railways in Italy," 8 p.m.
GRESHAM COLLEGE.—Professor Wagstaff on "Elementary Statics"—III., 6 p.m.

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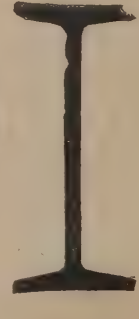
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ROYAL INSTITUTION.—Dr. A. Smith Woodward on "Recent Geological Discoveries"—III, 3 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Philip H. Newman on "Pageantry and Art," 9 p.m.

Friday, May 16.

ROYAL INSTITUTION.—Sir Robert Ball on "The Nebular Theory," 9 p.m.

GRESHAM COLLEGE.—Professor Wagstaff on "Elementary Statics," IV, 6 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Conversation at the Institution, Sterey's Gate, Westminster, at 9 p.m.

Saturday, May 17.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Hamilton Palace, Marsolem, Cadzow Castle High Parks, &c., and Barnclith.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion to Morpeth.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Visit to Cranham, North Ockenden and South Ockenden, in the neighbourhood of Upminster, Essex.

Tuesday, May 20.

NATIONAL REGISTRATION OF PLUMBERS (District Council for Cardiff, South Wales and Monmouthshire).—Mr. E. J. Sawyer on "Some Defects in our Local Sanitary System from a Plumber's point of view," 8 p.m.

Wednesday, May 21.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

Thursday, May 22.

SURVEYORS' INSTITUTION.—Country Meeting at Cambridge (First Day).

ROYAL INSTITUTION.—Mr. M. H. Spielmann on "Contemporary British Sculpture"—I, 3 p.m.

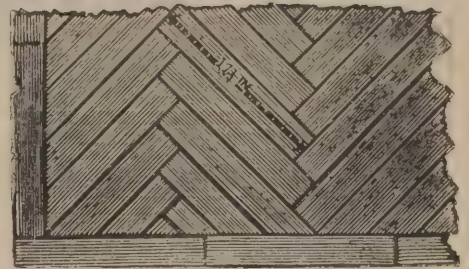
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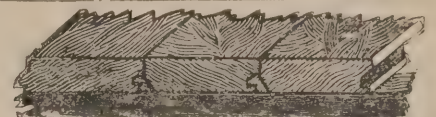
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Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 9 6	—
Lead, white, ground, carbonate ..	do.	1 4 10	—
Do. red	do.	1 0 4	—
Linseed Oil, barrels ..	do.	1 12 3	—
Petroleum, American ..	per gal.	0 0 6	0 0 7
Do. Russian	do.	0 0 5	0 0 6
Pitch	per barrel	0 7 0	—
Shellac, orange	per cwt.	5 19 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 11 6	—
Tar, Stockholm	per barrel	1 2 6	—
Turpentine	per cwt.	1 14 3	1 14 6

METALS.			
Copper, sheet, strong ..	per ton	69 0 0	—
Iron, Staffs, bar	do.	6 10 0	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 15 0	12 0 0
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Do. pipe	do.	13 10 0	—

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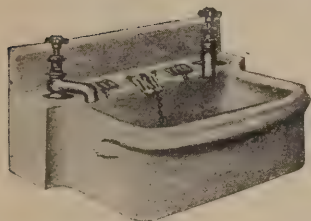
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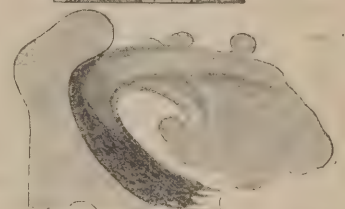
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An Architectural Causerie.

THREE weeks ago we gave some particulars of the scheme of decoration which the students of the Royal College of Art Modelling School proposed to carry out at Westminster Bridge under the direction of their eminent professor, M. Lanteri. The scheme is estimated to cost £750. The London County Council was approached with the object of securing this amount, and we are glad to learn that they have acceded to the request, and thus we may feel sure that no more effective decoration will be seen on the Coronation route than that of Westminster Bridge. Commercial firms of repute have produced some very pleasing effects in London on former occasions, but they are necessarily tied down by competition and time, so that their schemes often become monotonous, passive and unattractive. From these students, however, we may expect a thoroughly fresh treatment. The reputation of their school is a very notable one, and they will doubtless uphold it in their new effort. They will themselves execute the whole of the modelling and casting for the mere cost of materials, and we wish them every success in their enterprise.

Rodin. "I am seeking always the distinguishing trait that makes this man or woman an individual different from the rest of his kind. When I discover this *trait marquant* I dwell upon it, I insist upon it—I caricature it, if you like—until my bust has likeness; then I know that I *know* my model." These words of Rodin exactly explain his methods. They are difficult methods to understand: so strange, so much at variance with what we have been made familiar, that the first impression is often one of shock, even disgust. The Société des Gens de Lettres ordered Rodin to produce a statue of Balzac: he did so; but the Society refused the statue because "they failed to recognise Balzac in it." Yet that very Balzac is now regarded as one of Rodin's finest works. He met with the same objections at the Salon, where his work was refused because it was too original; critics on all hands assailed and decried him; but it is no less a sign of his endurance than of his wonderful talent that he has outlived the storm of hostile criticism, that he has, Antony-like, so reversed opinion that his work is now held up to the gaze of an admiring Europe; and lastly, at the age of sixty-two, that he should be the guest in London of our most prominent artists and sculptors. It is one gauge of a true poet that he leaves something to the imagination. Rodin, similarly, does not set a complete representation before our eyes, but, in his rough-hewn masses,

carves out the great idea so that we experience a feeling of wonderful strength in the conception and execution. It is gratifying that English artists should have so cordially recognised the genius of Rodin and that they should have secured for South Kensington that great bronze of "St. John the Baptist."

The Disappearing Strand.

BEFORE the old familiar Strand passes away altogether it may not be out of place to recall some of its features. Let us take the least important first. The Gaiety Restaurant and the adjoining theatre give us a not uninteresting piece of building of "the day before yesterday." Although built as late as thirty years ago it belongs to the Gothic Revival, and

playgoers, one of those simple bits of picturesque which may have been accidental, as such things often are, but which we shall never see again in London—the London of towering piles of flats and giant hotels. The fine old Strand is now in a condition to which Ruskin's words may be applied, "more tragic than uttermost ruin." The rebuilding has followed the modern London way; there is nothing systematic about it; it is "a thing of shreds and patches" and it is difficult to find a hundred yards of its length whose period can now be identified. All men are expecting all good things from the newest rebuilding and the demolition of Holywell Street, a genuine ancient thoroughfare which one cannot altogether help regretting. But what will be the future of the Strand? Is the new front of



THE SOLDIERS' AND SAILORS' MONUMENT, BROOKLYN, N.Y.
JOHN H. DUNCAN, ARCHITECT. FREDERICK W. MACMONNIES, SCULPTOR.

if not very striking is at least orderly in design. The Gothic is French rather than English, a style rarely used for civil and domestic work by our "revivalists." The lowest storey is broken by high and rather wide pointed windows; the second or *belle etage* exhibits a pointed arcade whose lights beneath are square-headed and divided by shafts with thirteenth-century foliated capitals, the tympana of stone pierced with quatrefoils, the arches bound with a broad band or dripstone. The floor above has smaller openings with similar shafts, capitals and dripstones, and a double arch to each. The upper floor has square-headed windows with plain mullions, and one would think that it was intended to carry the structure higher. The theatre has elaborate foliated tympana adorned with heads in medallions, the effect of which is not satisfactory; it also has archivolts in black and red brick. The side towards Catherine Street is architecturally effective—a vast space of blank wall, a chimney gable and shelter for

the Hotel Cecil typical of what it is to be? We trust not, for nothing more lumpy, coarse and commonplace was ever built in London and it is rendered worse by a vulgar affectation of grandeur. An architectural opportunity has been lost at the eastern corner of Wellington Street, where the buildings of Somerset House should have been brought out to the angle; hopeless incongruity is its present aspect. The truth is that the rebuilding of London is such a haphazard disconnected affair that if continued in the same spirit it can only end by giving us a city of mere confusion. Forty years ago the Strand was picturesque in the best senses of the term and contained many interesting old houses; its partial rebuilding has produced the most extraordinary jumble of "styles" and materials ever seen in this world. The next rebuilding can only be successful if unity of effect be aimed at. To direct that aim, however, must be the work of a master-mind, not of a crowd of conflicting authorities.



HOUSE AT HEADLEY HILL, HANTS. ARTHUR C. BLOMFIELD, F.R.I.B.A., ARCHITECT.

HOUSE AT HEADLEY HILL.

THIS house, which was built about two years ago from designs by Mr. Arthur C. Blomfield, F.R.I.B.A., stands on the top of a steep hill overlooking the country in a south-westerly direction towards the hills behind Portsmouth. The plan was designed to afford to the various living-rooms and bedrooms as much as possible of this beautiful view. The house was built by Messrs. J. Thompson & Co., of Peterborough, and is of red brick, the upper part being rough-cast plaster.

A NEW BRICKMAKING PROCESS.

Important Development at Peterborough.

FOR at least thirty-eight years bricks have been made in the Peterborough district from the Fletton clay, and about fourteen or fifteen years ago special machinery was designed by Messrs. Whittaker, of Accrington, for manipulating this particular shale clay by the dry process. Very great improvements have been effected from time to time; and with about eighteen yards in existence, and an invested capital of a million and a half sterling, the Fletton brickfields are now the largest in the world. The output last year was about 500,000,000, of which 400,000,000 were used in London and district, where the brick is very popular and is preferred to the old Kent stock brick. The reason is not far to seek, for every Fletton brick is turned out from the press perfectly true in shape, whereas the old stock brick was often warped, and the bricklayer can lay twice the number of Fletton bricks in the same time because he has not to turn and twist them about to make them fit. For the new War Office in Whitehall 25,000,000 Fletton bricks have been ordered for inside work.

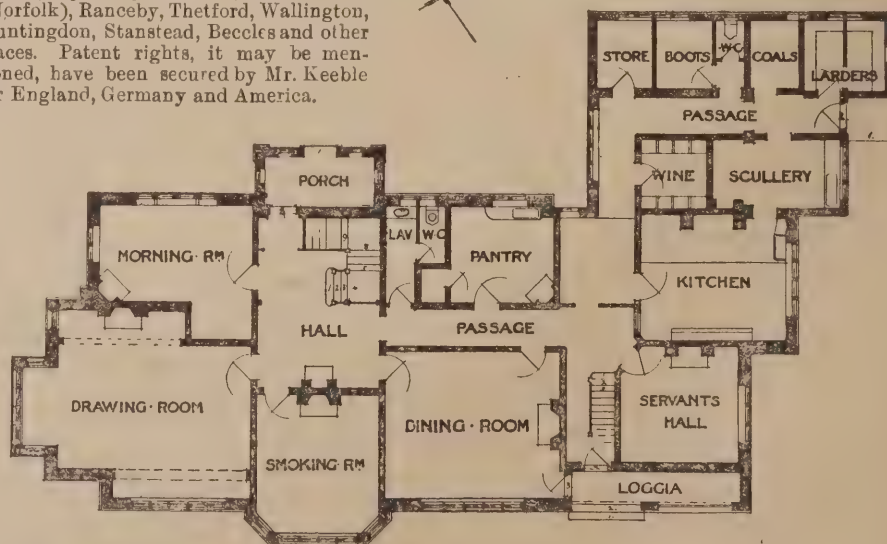
Hitherto only the common brick has been made at Fletton, and a red or facing brick was undreamt of. By a happy discovery, which it has taken about two years to work out, Mr. Arthur J. Keeble, deputy-mayor of Peterborough and managing director of the New Peterborough Brick Co., has been able to invent a process by which facing bricks can be turned out nearly as easily as the common brick, thus increasing the value of the brick from 15s. to 35s. and up to 45s. per 1,000; and the New Peterborough Brick Co., who have arranged for a royalty, are now turning

out both red and white facing bricks, as well as common bricks, at their yards. Under the old system yards turning out facing bricks could never be sure of the quantity which would come from the kiln fit for outside work, the average perhaps being only 50 per cent.; but Mr. Keeble, in an interview with a correspondent, said he claimed that by his process 99 per cent. can be turned out in any yard where the clay would burn red inside, and he added that he has already received applications for royalties from several parts of England and Ireland.

The new brick has been well tested, the Electric Light Works at Haggerston having been faced with them, whilst they have also been used in other parts of London, and at Sheffield, Croydon, Newmarket, Yarmouth, Skegness, Wymondham, King's Lynn, Peterborough, Norwich, South Norwood, Sibsey, Biggleswade, Eye (Suffolk), Tring (Herts), Spalding, Romford, Oulton Broad (Norfolk), Ranceby, Thetford, Wallington, Huntingdon, Stanstead, Beccles and other places. Patent rights, it may be mentioned, have been secured by Mr. Keeble for England, Germany and America.

NEW BUILDINGS IN LEEDS.

AT Leeds the building trades appear to have begun to realise the effects of the stagnation resulting from the "boom" of four or five years ago, and, if there be anything in the suggestion that the supply of buildings has got rather in advance of the demand, the prospects of an early recovery are not specially bright. Private building enterprise has certainly been almost at a standstill for some time past; and though plans have been prepared for the construction of more than twenty streets on the Earl of Mexborough's estate, between Chapeltown Road and Buslingthorpe, and for the erection of several thousands of back-to-back houses by a syndicate on the East End Park estate, there is



GROUND-FLOOR PLAN.

10 20 30 40 50 60

SCALE OF FEET



HOUSE AT HEADLEY HILL, HANTS. ARTHUR C. BLOMFIELD, F.R.I.B.A., ARCHITECT.

no assurance forthcoming as yet that these projects are in immediate contemplation.

Municipal policy, which, to a large extent, rises superior to the considerations that necessarily influence the speculative builder, cannot, of course, be ignored in discussing such a question, and schemes like the projected extension of Albion Place to Briggate are bound to lead to a certain amount of activity amongst builders, though a little further east the Corporation has failed, so far, to establish Vicar Lane in serious rivalry to Briggate. As to the arcades, which have become as distinctive a feature of Leeds as are the great squares in the residential parts of the city, apparently they exemplify a phase in the building development of Leeds that for the present is ended. To a certain extent, there is no doubt of the popularity of the arcade, but the comparative failure of two—in which shop rents have had to be reduced—and the deserted aspect of the latest, in spite of its Oriental magnificence, would appear to justify an opinion recently expressed that “the arcade business has been completely overdone.”

It is a striking commentary on the dimensions of the building interest of Leeds that, although complaints of slackness, if not actual depression, are so general, the building operations at present in progress may be roughly stated as representing an outlay of more than a quarter of a million. As the works are for the most part centrally situated, and are of a more or less public character, the idea of inactivity would doubtless be rejected with amused incredulity by the casual observer. Many of these buildings, however, are in a fairly advanced state, and the most careful enquiry fails to discover any indication that there is to be a continuance of building enterprise, even on the present modified scale. Of the works now in hand, the Market Hall, at the junction of Kirkgate and Vicar Lane, easily takes the first place in point of magnitude, representing, as it does, a capital expenditure by the municipality of £100,000. The new building, though detached, is in reality an extension on something like a colossal scale of the present Kirkgate markets, and on its completion Leeds will be equipped with one of the finest markets in England. The builder was at first hampered by difficulties, but lately the work has gone on with rapidity. It is estimated that the building will not be finished in less than two years; during the first thirty weeks it has been carried as far as the joists

of the first floor along the frontage to Vicar Lane and Kirkgate. The architects are Messrs. Leeming & Leeming.

The exigencies of street-improvement have brought about the demolition of many a familiar landmark, and one of the most notable changes in the aspect of Leeds will be the disappearance of the Roman Catholic Cathedral of St. Anne, which, with its clock tower and its tall octagonal spire, majestically commands the entire length of Park Row, a long vista of banking establishments. The present building is doomed because of the decision to widen Cookridge Street at this point, and the Corporation have provided a site for the new cathedral in the immediate neighbourhood. It will still be in a line with Park Row, but it will scarcely be so prominent as before. The removal enables the Roman Catholic community to erect a cathedral entirely worthy of an important and extensive diocese like that of Leeds. Mr. J. H. Eastwood, of London, is the architect, and the scheme will cost about £40,000. The site, by no means inconsiderable, would have been still larger if it had been possible to acquire some corner buildings belonging to the Freemasons. The buildings are to include, besides a cathedral of considerable architectural pretensions, a chapter-house and a residence for the clergy. Building operations were begun last autumn, and it is not expected that the work will be finished until the end of next year. The present cathedral will not, of course, be cleared away until the congregation can enter into possession of the new one. Cardinal Vaughan has promised to lay the foundation-stone, and the date of the ceremony has been fixed for July 26th, on the feast of the patron saint of the cathedral.

A difficulty concerning the observance of “ancient lights” has brought about a curious stoppage that must have puzzled a good many people passing along Park Row. Just below the great terra-cotta pile of the Prudential Assurance Co. a couple of buildings were commenced some time ago for occupation by the West Riding Union Banking Co. and the Hand-in-Hand Fire and Life Assurance Co. It was intended that both buildings should be five storeys high, but in the case of the more elaborate structure—the West Riding Union Bank—a neighbouring property owner has interposed, and since Easter building work has been suspended. Pending a settlement of the point in dispute—which, as indicated, relates to

the access of light to other premises—the building has not been carried much beyond three storeys. The front, of Huddersfield stone and Swedish granite, is decidedly ornate, and the elaborate carving, in bold relief, has attracted a good deal of attention. It is the work of Thewlis, the sculptor. Carved shields are also displayed bearing the arms of Leeds, Huddersfield and other West Riding towns. The bank chamber covers all the ground floor, and the intention is to let the rest of the building as offices, the rooms being arranged in suites. The architects for this and the adjoining new building, which may be said to represent an aggregate cost of about £20,000, are Messrs. Oliver & Dodgshun.

The future of Victoria Square, in front of the Town Hall, is a subject of unflinching interest to the Leeds citizen, and the question has lately become more topical than ever with discussion on Coronation and other projects. Since the Town Hall was built the general appearance of the square has apparently undergone no material change, except that due to the remodelling of Oxford Palace Chapel. Adjoining this, however, a new building for business purposes is in course of erection. The chapel is made to look rather squat by the Town Hall, which is built on much higher ground, and the new building will help to remove this impression. Its tower is to be 115ft. high, so that it will rise above the level of the roof of the Town Hall. Including an annexe to the school, the total cost will be a little over £3,000. The architects are Mr. G. F. Danby and Mr. W. H. Thorp.

Even after the lapse of a year or two, East Parade looks singularly deficient without the massive black masonry of East Parade Chapel. There is now rising up on its site a finely-proportioned building for the occupation of the North British and Mercantile Insurance Co., who, however, will only take a portion of the premises, letting the rest for office purposes. It is an interesting indication of the value of land in the centre of the city that no less than £31,000 was paid for the site, and as £30,000 is to be spent on the structure the undertaking is certainly one of the most costly as well as one of the largest of its kind in Leeds. The principal material used is Burmantofts terra-cotta, with brick facings. Mr. William Bruce is the architect.

The curious combination of a free library, police-station and fire-station is one which

seems to be very popular with the Leeds Corporation just at present, and really the attractive exterior of the new building on the edge of Woodhouse Moor has disarmed a good deal of the criticism with which the idea was at first received. Similar institutions are being built at Chapeltown and in Dewsbury Road. The latter, opposite St. Peter's Church, is making good progress and should be completed by Christmas. The Chapeltown establishment has been designed by Mr. W. H. Thorp, and about £8,000 is to be spent upon it.

The completion of the scheme for the improvement of North Street and the approach to Vicar Lane and New Briggate involves the demolition of the old Public Dispensary, and the Corporation have provided a site for the new dispensary fronting to North Street and Hartley Hill. The site will be cleared very soon, and building operations may then be commenced. The establishment, designed by Messrs. Bedford & Kitson, is to consist of a block rising five storeys from North Street, containing a board-room and the residential portion, while the dispensary itself, to the rear of this, is to include a large central hall, around which the surgical and medical consulting- and examining-rooms will be grouped. There is to be a small operating theatre and ophthalmic department, and a large and complete dental department.

The exceedingly plain exterior of the School of Art attached to the Leeds Institute in Cookridge Street and the general character of the building suggests the idea that utility has been the first consideration with the architects, Messrs. Bedford & Kitson. It was of this extension that Sir James Kitson, M.P., laid the foundation-stone in December last, and it is expected that by about next March accommodation will be ready for double the number of students dealt with in the present limited space. The basement, which is lifted well out of the ground, is to be used as workshops for the applied arts; on the ground floor the chief provision will be a lecture theatre, with large classrooms; on the first floor, rooms for designing, architecture, painting and elementary modelling; and on the second floor, rooms for drawing from the life and from the antique and for advanced modelling. The scheme is to cost about £12,000.

Amongst other building operations it may be noted that the finishing touches are being put to the Trades Council Hall in Upper Fountain Street, and that satisfactory progress is being made with the extension of the Central Fire-Station in Park Street. As to schemes in embryo, Mr. G. F. Bodley, R.A., is preparing designs for the new church and schools which Mrs. Meynell Ingram is presenting to the parish of Holbeck. Several architects have been invited to send in plans for building the Church of the Holy Spirit at Beeston Hill, and the matter is now in the hands of the assessor. A hall to the memory of the late Mr. Clayton and a parish institute are about to be commenced in connection with St. Aidan's Church, Halton.—(Extracts from the "Yorkshire Daily Observer.")

South Kensington Examinations in Building Construction.—In our next issue we shall publish questions and answers in Honours: Part I.

Ninety New Hotels at New York are now in course of construction, or will be before the end of the year, at a total cost of 40,000,000 dols. This is nearly double the number built last year, and is all the more remarkable because of a decrease of 40 per cent. under 1901 of other kinds of edifices.

A Discovery of Burial Urns was made recently in the course of laying-out new golf links at Sunningdale, near Camberley, on the Ridge Mount estate. The contractors decided to remove a mound 10ft. high by 40ft. across in order to make a teeing-off ground, and this being done the mound was found to contain ancient burial urns. Seventeen in all have now been unearthed. The urns are all of rude British make, and may be ascribed to pre-Roman times. It is thought that the remains belong to the age of Bronze, and probably to a late rather than an early date in that age—between 2,000 and 6,000 years ago. Some of the urns have been sent to the British Museum, the Reading Museum, to Oxford and to the Louvre.

A LEADING AMERICAN ARCHITECT.

ERNEST FLAGG.

THE first building that brought Mr. Flagg into prominence was the new St. Luke's hospital, on Morningside Heights, in New York City. Roughly speaking that is an affair of a decade ago. Rarely has an architect been so fortunate as to make his debut upon so monumental a stage, and a student of architectural history might be piqued to enquire whether this unusual opportunity was not merely a gift of chance, were he not stopped by the architectural worth of the building itself and by the rapid professional successes that followed it, won by its author in a series of works, which, in volume at least, represents a marked achievement even in these days of big "architectural plants" and large "outputs." Omitting for a moment the "personal factor," the explanation of both the initial opportunity and the subsequent success is to be found in the fact that Mr. Flagg brought to his task a very thorough preparation obtained at the École des Beaux-Arts. Mr. Flagg was fortunate in that he brought that particular training to America at that particular moment, thus joining a small coterie of architects possessed of a professional equipment similar to his own—men of "the school" whose work in the beginning of the 'nineties was coming into style, that is, coming to possess high commercial value.

American architecture at that moment was in a transitional condition. The "Romanesque movement," derived from Richardson, was running feebly to its impotent conclusion. It was in its very last stage. Practitioners were struggling to throw off the heavy archaic handwriting they had so laboriously acquired during the preceding decade and over, and in the main were turning for novelty to the "Classic" of Rome and to the Renaissance. It is interesting now from an historical point of view to study designs like that of Post's Havemeyer building on Cortlandt Street or R. H. Robertson's Corn Exchange Bank, to see the new tendency and the old habit struggling one with the other. The new Netherlands Hotel, the Metropolitan Telephone building, the Mutual Reserve building, were recent expressions of an expiring faith, whereas from designs such as those of the Bowery Savings Bank, the Waldorf Hotel, the "Mail and Express" building, the Herter residence, the John Jacob Astor residence, we obtain some idea of the many directions in which novelty was sought.

The conditions of modern architecture do not permit, or at least do not favour, a general style, and the Romanesque movement even at its height was signalized not only by the number of its adherents but by the contrasting achievements of the nonconformists. But although we cannot hope for a commonly accepted style, there is always observable a tendency towards some centre of design, and in the early 'nineties when Mr. Flagg entered practice he was extremely fortunate in bringing with him those particular architectural ideas that were destined in the next ten years to attract the profession, catch the public eye and become the basis of the latest "current style." Others before Mr. Flagg had enjoyed the benefits of the École des Beaux-Arts training, but, as was the case with the elder Hunt and with Richardson, this training was merely their schooling, and in much of the work of the former, and in still more of the work of the latter, one might easily miss all trace of the Parisian academic training. In Mr. Flagg's case, however, as in the cases of a few other "Beaux artists," the importation is obvious. No one, not even the man in the street, can possibly mistake, say, the Scribner building or the Singer building for anything but Parisian in general form and spirit, and even in such cases as, let us say, the homelike Clarke residence on Riverside Drive, New York City, or the splendid buildings for the Naval Academy at Annapolis, Maryland, no one at all instructed would hesitate for a moment in saying that, despite a foreign accent, such things speak French very well.

It must not be imagined that in describing as "importation" the ideas and training underly-

ing this work there is any intention to disparage. Those ideas and that training are, technically considered, the best the world to-day affords. They have a vitality and reality quite unmatched. If there be a distinctly modern style of value as fine art it is the French, however much one may be inclined to quarrel with it. In turning from the Romanesque and the Classic to Modern French, American architects directed their thoughts, at any rate, from the dead to the living, from a style archaic and obsolete, that had entirely passed from the world with the conditions that produced it, to a style, "foreign" it may be, but alive, producing its examples and capable of contemporary explanation.

Of course, fictitious in a sense the modern French style must always be for American architects, or at any rate for all who, unlike Mr. Flagg, have not acquired it, as their vernacular. And, despite the vast amount of work produced in it lately, little is at all vernacular. Probably none has more of the native spirit than Mr. Flagg's. With him it is not the French of Stratford-atte-Bow. Herein, no doubt, we have another reason for his rapid success or vogue, for clearly at a time and in a "movement" when all are imitating, and most imitating badly, the artist who draws, so to speak, "from the source," possesses a distinct advantage.

But neither the timeliness of Mr. Flagg's advent nor the "authenticity" of his product in the midst of a widespread imitative movement accounts for the high position he has attained in the ranks of his profession. The designs of few men in the country are more sought for and studied professionally than are Mr. Flagg's. This interest is, perhaps, livelier with men of the rising generation than with the older architects, and the basis of this interest lies in the fact that Mr. Flagg's designs are, if one may say so, so thoroughly professional or technical, have been so obviously arrived at by a special-trained process of thought, and are expressed in a manner so thoroughly grammatical and educated. His work is indubitably the work of a man who has thoroughly accepted certain well-defined principles from which he proceeds logically. There is nothing obscure, slipshod, unformulated; no groping, no obvious experimentation. The result is work wherein everything seems definitely and purposely "placed," and the building, as you study it, clearly "declares itself." One may or may not like the building, one may prefer something more structural or something more picturesque, but there is no denying that the building before one, such as it is, has been deliberately "done," is organic and logical, and represents a clear process of architectural thought and not a number of loose reminiscences forced together in some way on to paper. And there is something very admirable and, let us add, very French in this clearness. There is very little work in America that is so architectural or will stand technical analysis so well as Mr. Flagg's. We say technical analysis advisedly, because in many cases the excellences are more of a technical and formal character than of an imaginative order; much more likely to excite admiration from the educated than from the popular critic.

We hope no one will derive from this any idea that Mr. Flagg's work is "caviare to the general." The intention is to point out one of its distinctive excellences. As a matter of fact, no style to-day is quite so "taking" with the crowd as the modern French. Its very defects are of the sort that attract the public, and Mr. Flagg's buildings do not seem to miss popular appreciation, because they are technically excellent as well as French. But then popular admiration of a design rarely reaches what is really architecture.

Finally, we ought to qualify what we have already said by pointing out that Mr. Flagg is not always French. Witness the F. K. Bourne residence, the admirable Lawrence Library and his own country place on Staten Island. These show that his thoughts are free enough in other styles, but even here we may notice the same good qualities of design that distinguish his Parisian mode—logical clearness, freedom from eccentricity and all those irritating marks of the uneducated pencil.—(Introduction to an illustrated article in "The Architectural Record" (New York) for April, 1902.)

Bricks and Mortar.

APHORISM FOR THE WEEK.

*Lie heavy on him Earth, for he
Laid many a heavy load on thee.*

Our Plates. THE dining-room at Birkby Lodge, Huddersfield, is panelled in walnut and has a coloured plaster ceiling, with a frieze decoration illustrating "The Holy Grail," painted by Mr. F. B. Jackson. Mr. Edgar Wood is the architect—The dining-room of the house at Scarborough is now being carried out. The framing is being executed in mahogany with carved pateras inlaid with sycamore and ebony. The decoration over the chimney-piece in the ingle nook is in modelled plaster, which will be waxed. The colour scheme is yellow brown for the ceiling fillings, the carpet soft green, with green Dutch tiles in the fireplace. The architect is Mr. Arthur J. Penty, of Effingham House, Arundel Street, Strand, W.C.

Liverpool Cathedral Bill. ON the 13th of May the Bill promoted to give statutory authority for the purchase of the St. James's Mount site and the erection of a cathedral for the diocese of Liverpool came before the Earl of Morley, Chairman of Committees of the House of Lords, as an unopposed measure. It was stated that a sum of £156,000 had been subscribed towards the scheme. With the exception of St. James's Cemetery the site belonged to the Corporation; and in regard to the cemetery the Cathedral Committee proposed, with the consent of the trustees, to take over the trusteeship. They thought it desirable that the cemetery should form part of the precincts of the cathedral. It was now very little used. A proviso was submitted that when it was certified that any portion of the cathedral was fit for the celebration of divine service the Ecclesiastical Commissioners were empowered by Order in Council to transfer the pro Cathedral of St. Peter to the new cathedral, to substitute the church of St. Nicholas for that of St. Peter as the parish church, and to dispose of the building and site of St. Peter's Church. With this amendment the Bill was ordered to be reported to the House for third reading.

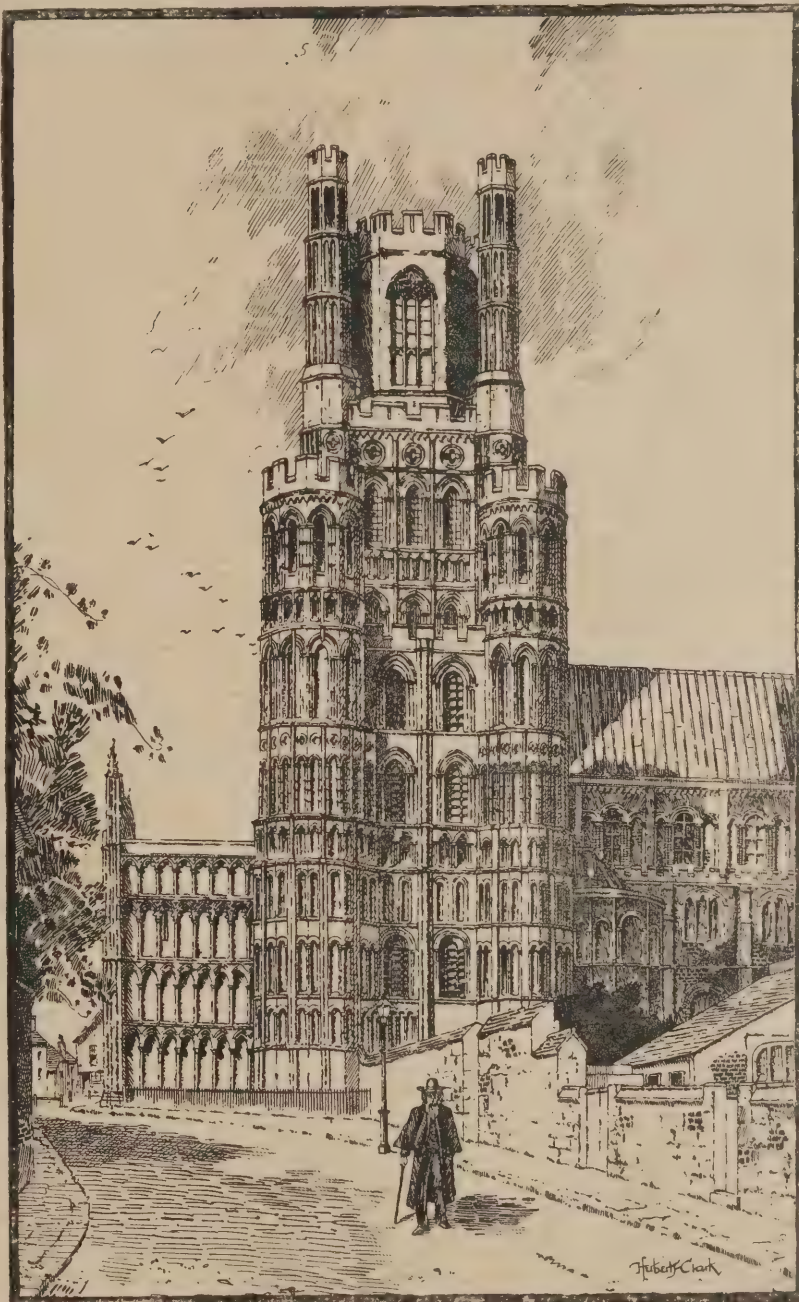
Llanbrynmair Church Restored. LLANBRYNMAIR parish church, Montgomeryshire, has been restored at a cost of £750 from plans by Mr. Liddon Walters, architect, Fine-bury Circus Buildings, E.C. The church, which is dedicated to St. Mary, marks the summit of a little hill rather to the south-west of the exact centre of the parish. Its date is ascribed by some to the twelfth century, while others claim for it a much earlier foundation—as early, indeed, as the seventh century. The church consists of a nave, chancel, north transept or cross-church, south porch, and a massive belfry tower at the west end, separated from the main body of the church by a partition of timberwork and plaster. There are indications that at one time the belfry was open to the rest of the church. Formerly, a singer's loft stood at the west end, the entry to which was through the belfry. This was pulled down in 1860. The walls are of great thickness, and the style of architecture may be described as Early English of the latter part of the fourteenth century. All the windows, with the exception of a genuine old window of the Perpendicular style, were renewed in 1860. The belfry is mainly supported by four immense pillars of oak, square cut, 14in. each side and 22ft. long, which go nearly to the top. The tradition is that they were all cut out of one "brenhinbren," or royal tree. The font, a circular bowl standing on octagonal stem and base, is early. There are two piscinæ in the chancel, one on the south side and one on the north side. Under the present scheme of restoration the north transept, hitherto partitioned off to form a vestry, has been thrown into the church, and a wood-block floor on concrete laid down, the nave raised, a vestry formed under the bell tower, and the early window restored to its original size. The tower has been made safe, the lych-gate has been improved, and wide steps substituted for the extremely narrow stairway leading from the road-

way to the churchyard. The contractors were Messrs. E. Evans & Son, of Cemmaes.

Church Building Society. THE annual general court of the Incorporated Church Building Society was held on Thursday last at the Church House, when the chair was taken by the Bishop of London. The annual report having been read, the chairman gave an address, and in the course of his remarks said the Society had shown itself a real pioneer in a good cause, and when they noted the small income it would come as a surprise. It had about £7,000 or £8,000 a year at its disposal for building churches throughout the whole of

the necessity for cheap churches with reference to the mushroom populations springing up in our great cities and towns. He advocated western galleries; their influence in improving the acoustics was remarkable. Referring to memorial windows the speaker expressed the opinion that only 5 per cent. of them were fit for the position they occupied. The rest were a degradation to God's House, and could not be other than unworthy memorials of our honoured dead.

Ely Cathedral. THE foundations of Ely Cathedral were laid by Abbot Simeon in the reign of Henry I., but he did not live to



ELY CATHEDRAL. DRAWN BY H. FULLER CLARK.

England. They would be worse than ungrateful if they judged the importance of these old societies by the size of their annual incomes. That Society had been the pioneer of a great church-building movement throughout the country. Never was there a time when its work was more needed than to-day. The Bishop of Southwell moved that the report be adopted and circulated under the direction of the committee, and this motion was seconded by Mr. W. D. Caröe, M.A., F.S.A. Mr. Caröe reviewed the work of the Society from the architect's point of view. He said that the conditions of church building and architectural practice had largely changed with the recent rapid growth of provincial and county towns. He alluded also to

fini-h more than the old choir and transept, and of his work the latter only remains. The nave and the great western tower—as high as the first battlement—with its south wing, are the next portions in point of antiquity, the former being completed in 1174 and the last named in 1189. The upper portion of the tower was subsequently added, but its injurious effects were soon discovered, and large sums had to be expended at different times owing to the superincumbent weight, and the north wing was probably destroyed by this addition. The south wing has polygonal turrets at the angles, that at the south-west angle being nearly double the diameter of the other, although they are of equal height. This wing, with its turrets, is covered

all over with ranges of arches: the three lowest are circular, the fourth are trefoiled-headed, the fifth and all above on the turrets, which rise considerably above the wing, are pointed and profusely adorned with Norman mouldings.

Osiris.

ON Thursday last Professor Flinders Petrie gave his annual public lecture at University College, describing the excavations of the Egypt Exploration Fund during the past winter at Abydos in Upper Egypt. In previous years the order of the prehistoric period had been determined, and the series of early Royal tombs had shown the earliest history of the kingdom. The present year's work had connected these ages and proved how the end of the prehistoric series joined the early dynasties. A town founded in the age of the beginning of the kingdom, three centuries before Menes, lay just behind the earliest sanctuary, that of Osiris. This town was repeatedly rebuilt, and a stratified mass of remains was gradually accumulated at the average rate of 20in. a century. This deposit has now been explored and all the pottery, flint, tools, amulets, and other objects compared. We now possess the continuous written record of 7,000 years of history, united to the earlier stages of civilisation, covering about a couple of thousand years before the written history. This town has yielded hundreds of pottery jars and bowls of a great variety of shapes, some hundreds of flint tools, the grinding tools with which the stone bowls were manufactured, the pottery fireplaces decorated with patterns, examples of the glazed tiles made for wall decoration, the amulets, ornaments and toys, all of the beginning of the historic times. A series of large graves full of vases of stone and pottery were also found in the town; these will be reconstructed in original order in different museums. The temple of Osiris dates as far back as the building of the XVIIIth dynasty, about 1500 B.C. In the temple ruins were inscriptions and statuary ranging over about 3,000 years, including some fine architectural pieces of the XIth and XVIIth dynasties, a striking red granite head of a king of the XIIth dynasty, some portraits of the XVIIIth dynasty kings, and some broken statues of goddesses, which show a hitherto unknown revival of very pure style in the XXXth dynasty. The lecture this week will deal with the discoveries in the cemeteries, which include the largest tombs known in Egypt; and the work of the Egyptian Research Account around the temple of Sety, explaining its purpose and design. The usual exhibition will be held during July at University College.

Cecil Rhodes' Grave.

THE grave of Mr. Cecil Rhodes is situated at the top of one of the highest boulder-crowned eminences in the Matoppos, and is cut out in solid granite rock, the work having been superintended by Mr. Douslin, a prominent architect of Bulawayo, whose design for the new Town Hall at Bulawayo—to be erected at an estimated cost of £20,000—was premiated recently. The grave is quarried rather more than 3ft. deep, and upon it after interment—as in the case of the holy sepulchre—was rolled an immense boulder, bearing the simple inscription "Here lie the remains of Cecil John Rhodes." Mr. Douslin has sent his old friend Mr. Harry Hems, of Exeter, a spawl of the actual granite, quarried in the grave. It is a hard grey variety of much the same character as that found so abundantly in the West Country, partaking, perhaps, more of the texture of the Cornish granites than of those of Dartmoor. The specimen to hand is evidently what is known technically as "surface granite," but suggests that lower down there must exist vast deposits of granite equal to any the world has yet produced.

New Street Name-Plates.—Workmen from the Westminster City Council have begun to erect fresh name-boards in the streets around the Houses of Parliament. The method adopted is ingenious and effective. The name of the street is inscribed in large black letters on a snow-white porcelain ground, and the name of the division of London is placed in smaller red letters above the name of the street. The porcelain plate is framed neatly in oak.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Graphic Statics.

BURGESS HILL.—E. W. B. writes: "Kindly recommend an elementary book on graphic statics."

Get Anglin's "Design of Structures" (Griffin & Co., Ltd., price 16s.), as, although expensive, it will be of great use to you in other ways. Middleton's "Stresses and Thrusts" (Batsford, 4s.) is a cheap book.

Iron Doors.

PORTSMOUTH.—T. O. S. F. writes: "How is a panelled iron door made, such as that illustrated on p. 147 of your issue for April 23rd?"

The panelled iron doors are made by riveting strips to represent the framing on a sheet of iron which then represents the panels. They are usually flat on the inside and appear panelled on the outside, but may be panelled on both sides. It is important that they should shut into a rebate in order that when distorted with heat they may not let the flames through the joint so readily.

HENRY ADAMS.

Bridge Construction.

PORTSMOUTH.—T. O. S. F. writes: "Please name a reasonably-priced book dealing with bridges of stone, concrete and wood."

We know of no single work which adequately deals with stone, concrete and wood bridges, but the following will give the information required:—"Arches in Wood, Iron and Stone," by Charles E. Greene (price 10s. 6d. nett); "Wooden Trestle Bridges," by Wolcott C. Foster (2s. nett); "De Pontibus," by J. A. L. Waddell (12s. 6d. nett). All these books are published by Chapman & Hall, Ltd.

Compressive Weight on Brickwork.

NEWCASTLE.—SPERO writes: "Kindly answer the following examination question: 'What is the safe compressive weight on stock brickwork in mortar and in cement? Give plan of square pier of brick in cement to take 30 tons safely.' Will the strength alter with the height?"

The weight per ft. super. at which fracture commences in brickwork hard stocks in Portland-cement mortar is about 40 tons, and 30 tons for ordinary well-burnt London stocks. The safe weight should not exceed 10 tons. The strength of a pier alters very materially with its height, and it is therefore impossible to answer the last part of the question.

Stresses.

MANCHESTER.—J. S. W. writes: "(1) Is it correct to deduct the weight of the supporting member or structure from the safe weight which it has been determined by calculation to be capable of supporting? (2) Is it correct in stress diagrams to consider the weights of the various members of a framed structure as acting downwards at the junctions? (3) What angle of light should govern the dimensions of an area or courtyard within a large block of buildings in order that there may be adequate illumination?"

(1) No; the formulæ allow for this. (2) The weight of the structures has of course to be considered. (3) 45 degs.

Rights of Light.

LIVERPOOL.—L. W. W. writes: "Can any claims for damages for interfering with lights be made against me in building a house next to another house but having the space shown between (4ft. to the dividing wall and 10ft. from there to the wall of the old house)? The fronts of both houses are to the street. The height to the eaves of the new house is about 30ft."

If the commanding window in the present house has not, at the date of its obstruction, been

in existence for nineteen years and a day, no action can be taken, and you are free to do as you like. On the other hand, if it has been in unobstructed existence for this period it has become an ancient light, and dominant rights over your property have been acquired. You must either keep your new building within the dotted line shown on section or come to some arrangement with your neighbour. Probably as the window in question faces a blank wall it is one which does not require much light, in which case your neighbour may be willing to allow you to build to the extent desired in return for quite a small monetary consideration. A formal agreement to this effect will be necessary, and ought to be drawn up by a solicitor.

G. A. T. M.

Safe Load on Stone Piers.

PARTICK.—W. M. writes: "What could be the least safe size on face for a pier of, say, good red sandstone (Ballochmyle), assuming the depth to be 2ft. and the height 13ft., set in the centre of a 27ft. opening and carrying three 12in. by 6in. by 42lbs. I steel joists which are assumed to have full safe load (distributed)? If red Aberdeen granite were used in, say, four courses, what would be the least size on face, the other dimensions remaining the same?"

This question is too vague to be answered. It must surely be known what load the three steel joists have to carry, though this is not named. Then the statement says the pier is situated in the centre of a 27ft. opening, but the sketch shows two equi-distant piers in a wider opening with overlapping measurements of 27ft., although to all appearance the joists form a continuous girder over three equal spans. Also, courses of stonework are referred to, but the height of a course is not named.

HENRY ADAMS.

Architectural Perspective.

CHELMSFORD.—J. H. M. writes: "Kindly recommend a book which deals fully with the methods of setting out shadows in architectural drawings."

"Architectural Perspective," by F. O. Ferguson (B. T. Batsford, price 3s. nett).

Books on Timber Measurement.

BRADFORD.—BOOTH writes: "Is there a book that deals with the measurements of timber, with prices?"

W. Richardson's "Practical Timber Merchant" (3s. nett), or W. Dowsing's "Timber Merchant's or Builder's Companion" (2s. 6d. nett), give methods of measuring timber, with tables, &c., but we know of none that give prices as well. Both can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Party Walls.

QUERIST writes: "Two buildings (City of London) are divided by a party wall; one of the buildings is six storeys high, the other five storeys high. Both properties originally belonged to one owner, who has now sold the five-storey building, retaining the six-storey building. The new owner of the five-storey building is about to add a top storey, thereby making more use of the party wall than heretofore. Can the owner of the six-storey building claim compensation in respect of this?"

Unless there is some special condition in the conveyance, the owner of the six-storey building can claim to be paid one-half of the cost of so much of the wall as is proposed to be made use of by the adjoining owner. In *Weston v. Arnold* (Bristol Improvement Act, 1840-7) it was held that "a wall may be a party wall to such height as it belongs in common to two buildings, and cease to be a party wall for the rest of its height," and this judgment was upheld by Mr. Justice Wright in a more recent case, *Drury, D. S., v. Army and Navy Stores* (2 B.D., vol. xii., 400). Section 58 of the London Building Act, 1894, provides that "where a wall built before or after the commencement of this Act, becomes after the commencement of this Act a party wall in any part, the wall shall be deemed a party wall for such part of its length as is so used." The wording of this section is ambiguous, but it appears to recognize that a wall may be in part a party wall and in part an external wall.

J. H.

Masters and Men.

The Carlisle Painters' Strike.—About half a dozen firms in the city continue to hold out against the demands of the Carlisle branch of the National Society of Painters, and the result is that numbers have left the city and obtained work in other towns.

The Darlington Painters' Dispute.—The Board of Trade arbitrator (Mr. Thomas Blashill, F.R.I.B.A.) has made his award in the matter of the dispute between the master-painters and operatives. The men, who are members of the Darlington branch of the National Amalgamated Society of Operative House- and Ship-Painters and Decorators, asked that rule 1 (of the local rules) be altered so as to raise the standard rate of wages from 7½d. to 8d. per hour. They asked for alterations to rules 13 and 14 and an alteration of the rule in respect to payment for overtime. This latter was withdrawn before the arbitrator, who now finds no reasons adduced for the alterations desired in rules 1, 13 and 14. In other words, Mr. Blashill's award is in favour of the employers and against the men.

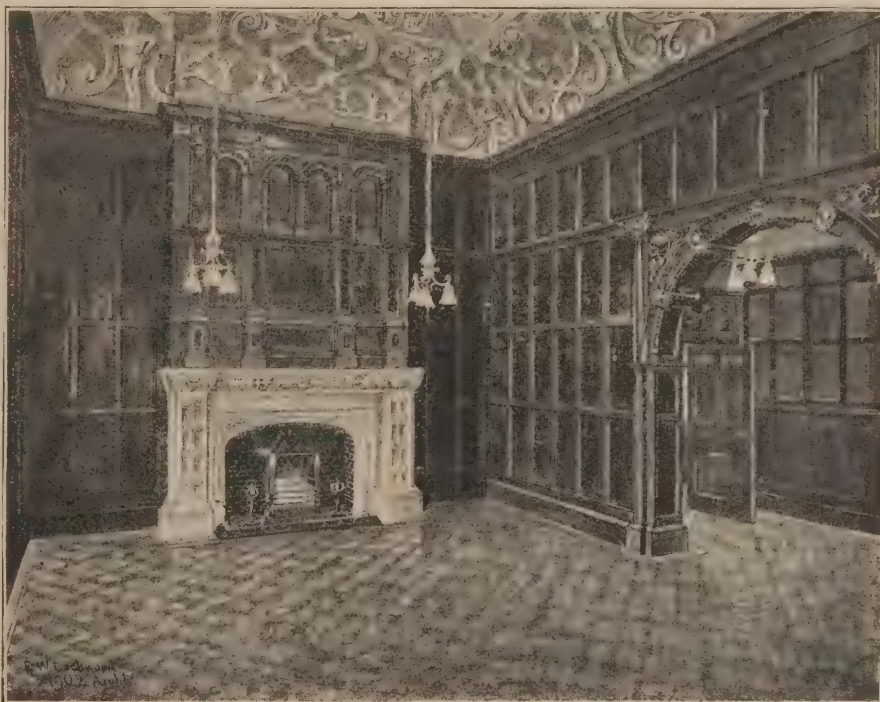
The Carpenters' and Joiners' Society has just issued its forty-second annual report. The general secretary (Mr. F. Chandler) regrets his inability to refer to any feature calling for special congratulation, as for the first time in fourteen years their receipts did not meet the expenditure during the current year. It had been necessary to draw upon the accumulated capital to the extent of about £22,000, and the only satisfaction they could derive from this was the knowledge that this extraordinary demand had been met without requiring increased contributions from the members. A combination of events was responsible for this heavy outlay, the primary one being the attempt made to reduce wages in various parts of the country, and the relentless opposition offered to every proposal for improving the conditions of labour, leading to numerous disputes. The society closed the year with 816 branches, an increase of fifteen, and 67,018 members, an increase of 2,006. The receipts had amounted to £163,938, or £5,446 above the previous year, but the disbursements reached a total of £186,362, or £31,427 more than in 1900. The cash balance at the close was £181,665.

Labour in April.—The Labour Department of the Board of Trade reports that on the whole employment in April showed no material change as compared either with March or a year ago. As compared with a year ago there has been an improvement in the iron and steel trades, but a decline in engineering. In the 224 trade unions, with an aggregate membership of 550,958, making returns, 21,349 (or 3.9 per cent.) were reported as unemployed at the end of April, as compared with 3.7 per cent. in March and 3.8 per cent. in the 216 unions, with a membership of 517,197, from which returns were received for April, 1901. The mean percentage of unemployed returned at the end of April during the ten years 1892-1901 was 4.2. Employment in the building trades has improved in some branches when compared with March, and is about the same as a year ago. The percentage of unemployed union members among carpenters and plumbers at the end of April was 3.5, compared with 4.1 per cent. in March and 3.4 per cent. in April of last year. Thirty-two fresh disputes began in April, involving 3,635 workpeople, of whom 2,786 were directly and 849 indirectly affected. Of the new disputes in April six took place in the building trades. Of the twenty-four new and old disputes, affecting 3,221 workpeople, of which definite results were reported, five were decided in favour of the workpeople, ten in favour of the employers and nine were compromised. The changes in rates of wages reported during April affected 12,947 workpeople, and the net effect of all the changes was an increase averaging 4½d. weekly per head of those affected. Of the total number, 5,755 received advances and 7,192 sustained decreases.

Billiard-room, "Craigmoor," Huddersfield.—The panelling around this billiard-room (for Mr. H. F. Clayton) is in solid oak 13ft. 9in. high, including the cornice. The ceiling is in modelled plaster, the chimney-piece of Hopton Wood stone and the flooring of oak parquet. Mr. E. W. Lockwood, of Huddersfield, is the architect.

Law Cases.

What are "Alterations" and "Additions"?—*In re Clarke's Settlement* came before the King's Bench Division of the High Court of Justice on Wednesday last. This was a summons by the tenant for life of "Swankeys House," near Uxbridge, and the main question was whether the installation of the electric light was an "addition" or "alteration" within the meaning of section 13, sub-section (ii.) of the Settled Land Act, 1890. Mr. Justice Buckley, in giving judgment, said that in his opinion the word "alteration" in the section in question meant a structural addition in some sense. An alteration in a building must of necessity be structural. The argument put forward by the tenant for life amounted to this, that whereas of the two nouns substantive the word "alteration" must mean structural alteration, the other word "addition" did not mean structural addition but the addition of anything. His Lordship did not understand that to be the true construction of the section. As his Lordship understood the section,



NEW BILLIARD-ROOM, "CRAIGMOOR," HUDDERSFIELD.
E. W. LOCKWOOD, ARCHITECT.

it meant the addition to the building of some further building or the alteration of the building by removing and replacing in some form of some part of the building—i.e., both the one and the other must be structural. The matter was not without authority. In *In re Gaskell's Settled Estates* (1894, 1 Ch., 485) Mr. Justice Chitty held that the providing of heating apparatus and pipes was not an "addition to or alteration in the building" within the section. It was said, however, that in *In re Freake's Settlement*—*Finnaid v. Freake* (1902, 1 Ch., 97) Mr. Justice Joyce held that the provision of an electric lighting installation, exclusive of fittings, was an "addition" within the section and might properly be paid for out of capital money. His Lordship, however, had had an opportunity of seeing Mr. Justice Joyce, who informed him that his decision in that case was not intended to lay down any general principle, but was confined to the particular case before him. But, however that might be, where, as here, there were two decisions in conflict, his Lordship was at liberty to follow his own judgment, and his view was that the addition or alteration, to come within the section, must be structural. In the present case the installation of electric light was no doubt reasonably necessary in order to enable the house to be let, but in his Lordship's opinion it was not an addition or alteration within the section. The application was therefore dismissed.

District Surveyors in London: Important Case.—The case of the *Mayor, &c., of Westminster v. Watson and others* came before the King's Bench Division of the High Court of Justice on Thursday last. This was a special case agreed upon by the parties under section 29 of the London Government Act, 1899, raising the question whether the district surveyors acting under the London Building Act had any and what powers or rights and duties in respect of the supervision and inspection of wooden structures now being set up for the purpose of enabling persons to view the Coronation procession. The Lord Chief Justice, in giving judgment, said that the second schedule of the London Government Act, 1899, transferred from the County Council to the borough councils the power under section 84 of the London Building Act, 1894, to license temporary structures. Section 84 contemplated that the licence might contain conditions in respect to the structure and the time that it should continue. There were in that Act provisions as to the duties of the district surveyors, who were not exactly servants of the County Council, though under its juris-

diction. No one could contend that it was intended to transfer to the officers of the new councils the duties of the district surveyors; but the transfer of the powers of the County Council might by its operation destroy some of those duties. The Court therefore had to consider what was the true view of the law, having regard to the position of the County Council and of the district surveyors and to what was intended to be transferred. The city council could specify the conditions of the licence and could add any safeguard that they thought fit. If any duties were imposed on anybody by the licence they were not imposed on the district surveyors. The transfer to the borough councils did not destroy any of the rights or duties of the district surveyors except in so far as the transfer involved their alteration or destruction. In the light of those general considerations he would answer the three questions:—(1) In so far as the duties depended on the terms of the licence, it was not a question of transfer. It was a question of duties imposed on the officers of the city council by the terms of the licence. Therefore the district surveyors did not have the right or power of performing the duties imposed by the licence unless the licence expressly imposed duties on them. The answer to the question was that they were not transferred, and the district surveyors had no powers, duties or liabilities under the licences which were granted by the city council. (2) He thought

that the district surveyors were entitled to have notice under section 145 of the London Building Act, 1894, but not of all the things specified in that section, because they were not all applicable. He did not mean to suggest that the district surveyors could exercise functions which had no relation to the character of the structure being erected. (3) The right to receive the fees clearly had not been transferred to the city council and its officers, but he did not think that the right had altogether lapsed. The reasonable and proper thing would be for the County Council to exercise their powers of allowing a less fee because the duties would be less. If in a proper case a district surveyor, for good cause on information received, had a duty to inspect, in order to see whether any provision of the Act had been infringed, he would be entitled to his fees, but he did not suggest that the district surveyors would be entitled to claim fees in respect of every one of these structures because they had certain duties under the Act.—Mr. Justice Darling delivered judgment to the same effect.—Mr. Justice Channell, in giving judgment, said that he did not think that it was correct to say that any duties had been transferred by the Act, because the district surveyors had a statutory position and were not mere servants of the County Council. The result seemed to be that the transfer of the duties of the County Council could not operate as a transfer of the powers and duties of the district surveyors, but incidentally the transfer had substantially diminished the duties of the district surveyors. The way to answer the questions was:—(1) Nothing had been transferred; but so far as any duties would formerly have been imposed upon the district surveyors by the licensing of such structures by the County Council, no such duties were now imposed upon them. (2) The structures were works of which the district surveyor was entitled to have notice. (3) If, in any case, the surveyor did inspect properly and not go for the purpose of getting his fee, he was entitled to his fee. The proper way for the County Council to meet this case was that, as the operation of taking away the licensing from them was very greatly to diminish the duties which would likely fall on the district surveyors, the County Council should make a direction, under section 150 of the Act, imposing a smaller fee to be given to the district surveyor in cases where the structure was licensed by the other authority.

New Patents.

These patents are open to opposition until June 23rd.

1901.—Automatic Electric Lifts.—9,019, J. BJÖRNSTAD, Orwell Lodge, Eritb. The lift is provided with as many pushes as there are floors, and when one of these is pressed it completes its own particular circuit and the lift rises and stops automatically at the floor desired. By pressing another button the lift is made to descend.

Independent Hot-water Radiators.—10,341, J. W. EWART, 46, Dartmouth Park Hill, London, N.W. At one end of the radiator, which is built up in sections in the usual way, there is a double-shell heated by a burner at the bottom. The water thus heated circulates throughout the radiator.

The following specifications were published on Thursday last, and are open to opposition until June 30th. A summary of the more important of them will be given next week.

1901.—8,907, NORRIS, rotary cutting tool for working wood or other material. 9,793, MYERS, drawing compasses. 9,902, THIOILLIER, fixing bolts, screws, &c., in wood. 10,527, NEWMAN, ventilator. 11,368, HALLER & MACHELL, sewage filters. 12,029, PULSOMETER ENGINEERING CO., LTD., & PEMBERTON, grinding mills. 12,642, LION, dowels. 12,752, SCHMIDHEINY, combined crushing mill and brick press. 13,516, WALSH & LEIGH, drain boxes for tramway rails. 24,145, BREMER, ceilings or floors.

1902.—877, ADAMS, supports for sinks. 1,231, CRABB, cocks and valves. 3,512, DODGE, moving stairways. 4,620, DUDLEY, appliance for measuring the internal diameters of sewers, pipes, &c. 5,165, MUNRO & VAN ORDEN, setting tiles. 5,305, KIRCHNER, band saws. 6,641, GEORGE, valves. 7,183, O'NEILL & BYRNE, pipe cutters.

THE AUSTRALIAN TIMBERS.

WOODS THAT COULD BE USED HERE.

By EDWARD T. SCAMMELL.

MR. EDWARD T. SCAMMELL recently read a paper before the Society of Arts on "The Timber Resources of the Australian Commonwealth." After pointing out how mutually important the subject was to Australia and Great Britain, and citing a table to show the vast quantity of timber available in the forest areas of the great colony, Mr. Scammell enumerated the various woods and their characteristics, as follows:—

New South Wales.*

Ironbark.—This is the principal hardwood of this State. There are four varieties of it, the white or grey, the narrow leaved, the broad-leaved (the ironbark of Queensland) and the red. Of these the first two are the most important. The white ironbark produces a timber pale in colour, while that of the narrow-leaved is deep red. Both are very hard, and are used for bridges, culverts, railway sleepers, fencing posts and wheelwright work. The beams of this timber are of great strength.

Tallow-wood (also known as the turpentine and peppermint of Queensland).—This comes next in importance; but the supply appears to be limited. The wood is of a clear yellow or light reddish colour when newly cut, but changes afterwards to a pale brown. Its common name is due to the greasy nature of the wood. It is not only useful for bridge-decking, house-flooring, girders, piles and fencing-posts, but makes an excellent paving-wood. It is at present very much in use in the streets of Sydney for this purpose.

Blackbutt.—This is specially adapted to house- and ship-building and brick-decking. It is also useful for paving purposes.

Grey Gum.—While similar in appearance to blackbutt, and by some regarded as an efficient substitute for it, grey gum is not suitable for long girders or beams. Its special use is for coachbuilders' work—felloes and spokes.

Murray Red Gum (also called flooded, red or white gum).—This is the common river gum of all the Eastern states. It is not so easily split as blackbutt, as it is unusually short in the grain and inlocked. It is one of the best hardwoods for contact with the ground. For street-paving it has the common fault of Australian woods, especially those that are not properly seasoned or sufficiently matured, namely, contraction and expansion when newly laid; but it is very durable, and one of the most abundant of Australian eucalypts.

White Mahogany (the stringy bark of Queensland).—This is somewhat like tallow-wood, and is often substituted for it. By some it is regarded as more durable than ironbark or box. It is a pale-coloured timber, tough and hard.

Red or Forest Mahogany.—This wood is of a rich red colour, very durable, and, like many other eucalypts, hardens with age. It resists the attacks of the termite (white ant), and is useful for general building purposes and street-paving.

Grey Box (the gum-topped box of Queensland) is useful for sleepers, piles, girders and wheelwright work.

Brush Box (the Brisbane box of Queensland) is of a grey or brownish colour. It is especially used for tram rails, tool handles, and works requiring a tough, hard and elastic material.

Sydney Blue Gum (the grey gum of Queensland) is easily worked, suitable for buildings, and is greatly valued by shipwrights and wheelwrights. In the northern part of New South Wales it is used for paving-blocks.

Woollybath, like red mahogany, belongs to the jarrah class of hardwoods, and is another useful wood for street-paving. Its timber is dark red, not unlike red ironbark. It is too brittle for girders and sleepers.

Spotted Gum is a tough timber of a pale yellowish brown. It is one of the best hard-

woods for bending. It is largely used for poles, shafts, cross-pieces, naves and spokes. It also makes a good paving-wood. The gum of this wood is said to contain 34.97 of kino-tannin.

Turpentine is useful for piles and dock purposes generally. It resists the white ant and, in tidal waters, the teredo or cobra. Its immunity in the latter case appears to arise from the oleo-resin which is secreted between the timber and bark, as in other woods of the same character. Hence piles should always be driven with the bark intact. This wood, however, is disliked by the sawmiller, as it quickly dulls his saw. The same may be said of other Australian hardwoods, but this is a mechanical difficulty which ought not to stand in the way of the adoption of otherwise useful timbers.

There are several varieties of conifers in New South Wales.

Moreton Bay or Hoop Pine is the principal cheap soft wood, and is used for packing-cases, flooring, ceiling, lining boards and butter boxes. It is far inferior, however, to the leading pines of Europe and America.

Brown Pine, otherwise Colonial deal, white pine and pencil cedar, known also as the native plum or damson (the she-pine of Queensland), is a much harder and more durable wood than the Moreton Bay pine, and is used for bridges and pier piles. It resists the white ant and, in salt or brackish water, can withstand, if the bark be left on, the attacks of the teredo.

The *Cypress Pine* has several varieties—the red or black pine, the Murray pine, the Port Macquarie pine and the Richmond River cypress pine. This series of pines is used largely for building purposes and for bridge-decking. They are seldom attacked by white ants. Resin obtained from the Murray pine, and from one or two other Australian pines, is available in considerable abundance. It is almost identical with the best sandarac of Northern Africa, largely used in the manufacture of varnishes.

Red Cedar.—This is a very excellent timber, very similar to American mahogany, but only half its weight. It is easily worked and is very durable. It is chiefly used for furniture and cabinet work. Scantling or small pieces, with figured grain, furnish timber of great beauty.

Red Bean, or turnip wood (the pencil cedar of Queensland), is a good furniture wood. It has a finely figured grain, and is often sold as cedar.

Rosewood (also a pencil cedar of Queensland), so called from the odour of the wood when fresh cut, is, like red bean, of a reddish colour, and is suited for cabinet-making and joinery. It is also said to furnish an excellent material for wine casks.

White Beech (the Queensland beech) is a strong, close-grained timber, easy to work and durable. It is in great request for decks of vessels, furniture, picture frames, carving and general house-fittings. It is also much used in coopers' work.

Silky Oak is much in demand for cabinet and coopers' work and butter boxes. The timber splits easily, is of a light colour, and shows a fine oak-like grain.

Black Bean (the Moreton Bay chestnut of Queensland) is a dark-coloured wood, close grained and durable, similar in appearance to walnut. It is a good furniture and cabinet wood, and makes excellent gun stocks.

Tulip Wood yields a hard, close-grained timber, marked with irregular streaks. It is highly esteemed for cabinet-making, for door panels, dados and billiard tables. It resembles olive wood in appearance.

Coach-wood is a light, soft, close-grained and tough timber, suitable for boat-building, cabinet work and, as its name denotes, coach-building.

Victoria.

Among the principal trees of this State are the *River Red Gum* (the Murray red gum of New South Wales), the *Red Ironbark* (a variety of ironbark), the *Grey Box* and the *Cypress Pine* (the Murray pine of New South Wales), all of which have been described in the list of New South Wales woods.

In addition are the following:—*Bairnsdale Grey Box*, which furnishes fine and durable pile timbers up to 60ft. or 70ft. in length, and is of high repute for railway, bridge and wheelwrights' work.

* The woods of New South Wales may be regarded as generally representing those of Queensland, Victoria and South Australia.

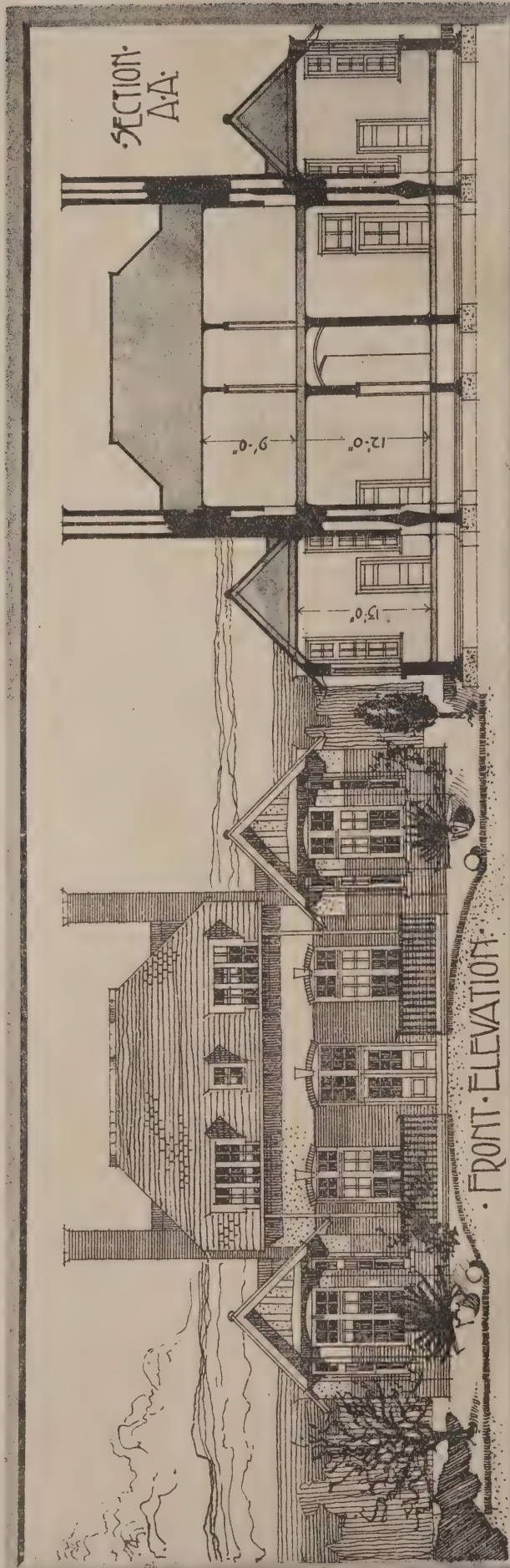
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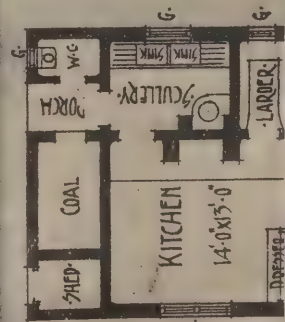
DRAWING-ROOM, BIRKBY LODGE, HUDDERSFIELD. EDGAR WOOD, Architect.

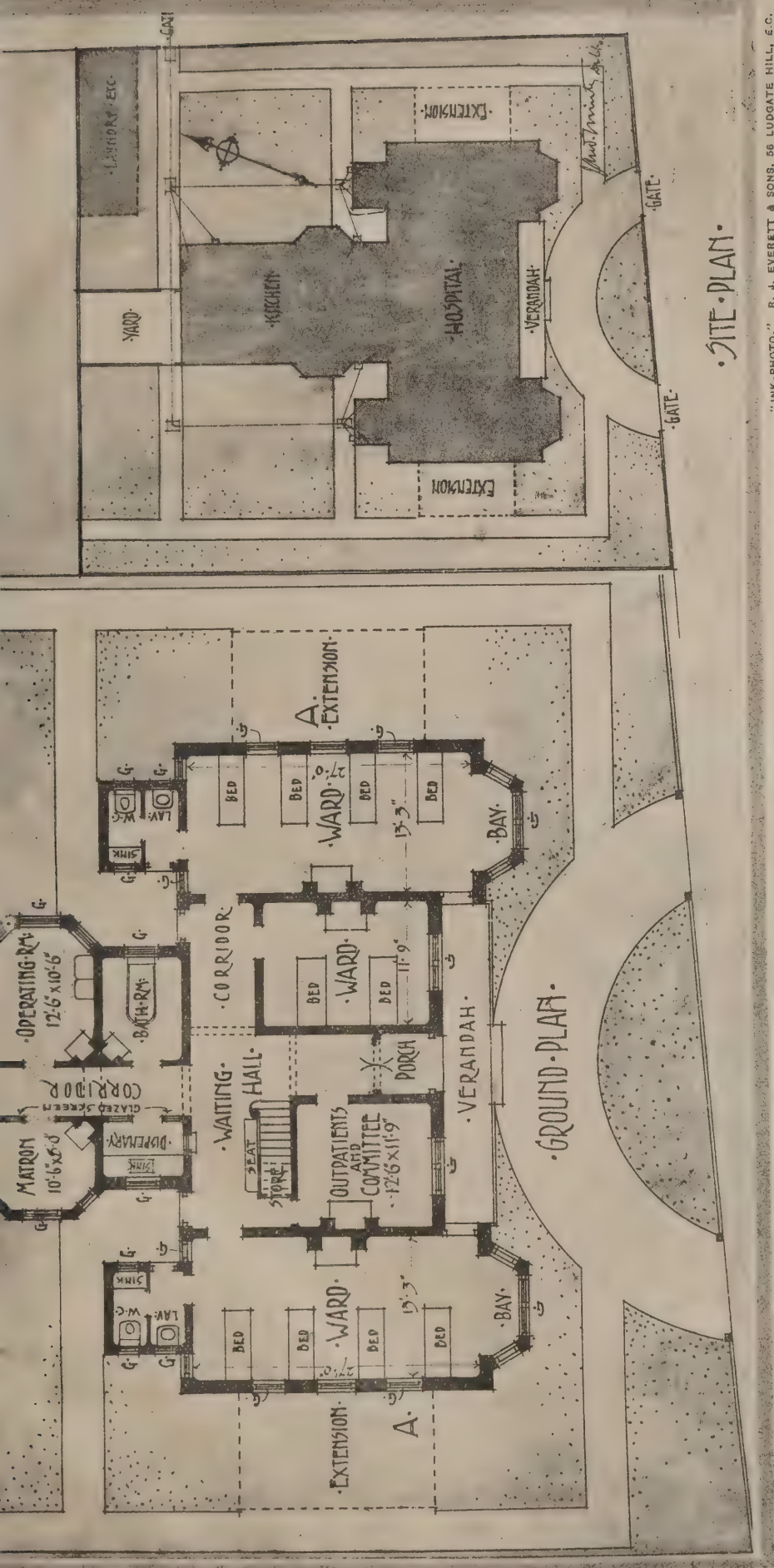
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Supplement to
 THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
 Wednesday, May 21st, 1902.



COTTAGE HOSPITAL.
 SUFFOLK.





• SITE PLAN •

COTTAGE HOSPITAL, SUFFOLK. JAMES A. MINTY, A.R.I.B.A., Architect.

"INK-PHOTO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

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DINING-ROOM OF A HOUSE AT SCARBOROUGH. ARTHUR J. PENTY, Architect.

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Stringy Bark, of which there are three varieties, all of which are used for building and general purposes. There is also the *Yellow Stringy Bark*, which is a strong and tough timber suitable for harbour works.

Blue Gum and *Messmate* (the same as the Tasmanian stringy bark) will be dealt with under Tasmania, where they are leading timbers.

Spotted Gum is different from the wood of the same name in New South Wales. It is similar to blue gum, for which, whether by error or design, it is often sold—a practice that is open to much objection whatever the quality of the wood may be.

Yellow Box is a heavy and inlocked wood suitable for piles and posts.

Blackbutt, otherwise the common mountain ash or peppermint, is the tallest tree of the Victorian forests, if not of the whole continent. It is a different wood from the blackbutt of East Gippsland, Victoria, which is the same as the New South Wales variety, and it differs also from Western Australian blackbutt. The Victorian wood is like English oak in appearance when properly seasoned, and is used for building purposes.

Silver-top or *Bastard Ironbark*, called also mountain ash, green-top and white ironbark, known in New South Wales as mountain ash and in Tasmania as ironbark, is used in both varieties for building purposes.

Blackwood.—This is the chief of fine grain woods. It is an exceedingly valuable tree, but, like many valuable Australian trees, has been so extensively sacrificed in the course of land settlement that it requires careful conservation to preserve the remains of the splendid forests in which it grew abundantly years ago. There are two Victorian varieties of this wood, one a greyish white and one a reddish colour.

Tasmania.

Tasmania, which from the similar character of its flora is naturally associated with Victoria, possesses, with the exception of Western Australia, the largest supply of timbers available for export of all the Australian states.

Blackwood (or lightwood) is found all over the island, and in many parts is very plentiful. It is extensively used for furniture, panelling for railway carriages, wainscoting and interior fittings. It resembles cedar in appearance.

Myrtle (the evergreen beech of Victoria) is abundant. It has been favourably reported upon by Messrs. Ransom, sawmill and mechanical engineers, Chelsea, for its strength and high finish. Its value for ballroom and other floors where there is great traffic is shown in the fact that it wears quite smooth, does not shred or tear, and is singularly free from knots or faults.

Huon Pine is a very durable timber, and is practically indestructible in water. It is used extensively for railway rolling stock, cabinet and high-class furnishing work, and boat-planking.

She-oak is a small tree, but it provides a handsome ornamental wood suited for cabinet and interior work.

Blue Gum is the most important of Tasmanian timbers, and is in considerable demand for harbour works and other purposes. Good piles, like those being supplied for the national harbour works at Dover, can be obtained up to 100ft. in length, with only a moderate taper. Blue gum has been tried for woodpaving in London, but from want of care in the preparation of the wood, or from other causes, it has not proved a success.

Peppermint is similar to, if not identical with, the blackbutt of Victoria. It is plentiful in Tasmania, and is specially used for roof timbers, but it is less pliant than most other eucalypts.

Swam Gum (stringy gum or gum-topped stringy) is the most common of all eucalypts in this State. It is in large demand in the local market for building and general purposes.

Stringy Bark is also very widely distributed. It is identical with the messmate of Victoria, and is regarded by some as the most valuable hardwood of the Australian forests. The grain of this wood renders it, when properly seasoned, specially suited for waxed floors, as it has a very brilliant appearance, is handsomer than oak and takes a good polish. It is used extensively for piles and other dock purposes. It should be serviceable for street-paving, as it is tough as

well as hard, but for its great tendency to warp and shrink, which can evidently only be overcome by careful seasoning and preparation.

Ironbark (the silver-top or bastard ironbark of Victoria) possesses similar qualities to blue gum. The wood has a reddish tint.

Queensland.

Most of the timbers described under New South Wales belong to this State also; but there are many others of commercial value found in the extensive forest areas of the country. At present, however, they are inaccessible, or no systematic effort is being made to exploit them. As the estimated extent of forest (in which trees having a local use are found) is equal to a third of the whole area of the country, while valuable commercial trees which might be made available for export cover about 40,000,000 acres, Queensland should ere long do a large and flourishing timber trade. In addition to the varieties referred to under New South Wales, this State possesses some other timbers which should not pass unnoticed. Among these are the following:—

Woollybutt.—This is a red-coloured, close-grained, tough wood useful for constructive and waggon work, and when large beams of hardwood are required.

Bloodwood is a durable wood if used whole for piles, posts, &c. It is also red in colour.

Kauri Pine is similar to the famous kauri pine of New Zealand. The wood is of a light yellow colour, free from knots, soft and easy to work. It is largely used for house-building.

Red Bean, identical with the New South Wales black bean, is regarded as a very valuable timber for general purposes.

Swamp Mahogany, whose wood resembles Spanish mahogany, is a hard and close-grained timber fitted for underground work and piles. It resists the ravages of the teredo better than any other Queensland wood.

Paper-barked Tea Tree, a number of varieties of which are common throughout Australia, is also valuable for underground work and piles.

South Australia.

This State has the smallest area of forest land of all the Australian States, and is therefore quite unable to enter the lists as an exporting country. The Government, however, is pursuing a very prudent course in planting large quantities of the most useful commercial trees, suited to the soil and climate, and is doing its best to encourage the growth of trees indigenous to the State, such as the *Sugar Gum*, a useful wood for railway and general purposes, which is said to be as durable as jarrah and equally able to resist the attacks of the teredo. Two other eucalypts, the *White Ironbark*, locally known as blue gum (the red ironbark of Victoria), and the *Grey Box*, common to Victoria, furnish strong, tough and durable woods inlocked in grain and suitable for the same purposes as sugar gum. The common flooded variety of *Red Gum* has a fairly wide distribution in this State. Among *Conifers* which have been grown with fair success are the Monterey, Maritime, Aleppo and stone-pines. But, in view of local needs, it will be many years before the forests of South Australia are likely to prove a source of revenue from any expert trade.

Western Australia.

The development of the timber industry of Western Australia in recent years places this State in a unique position in relation to the timber trade of the whole Commonwealth. To quote a late issue of the Government Agency, "One special advantage of the Western Australian timber industry lies in the fact that it is more completely and efficiently organised than that of any other Australian State, so that it can provide a continuous supply of timber on terms which may bring it within the reach of the home and Continental trade." This applies mainly to the two woods which form the bulk of the timber exports of the State, namely, jarrah and karri. But it may also relate to other timbers which are available for export, of which I propose to give a brief review.

Sandal Wood.—The first export trade of any kind done by Western Australia was in this wood, shipments of which have been made since 1849. The present quality of this excellent

wood is said, in a recent report of the Woods and Forests Department, to be inferior, owing to the want of care on the part of the cutters in properly preparing it for the market. This matter, however, is receiving attention, as is the general question of the conservation of this useful and revenue-producing timber.

Jarrah.—This is by far the leading and most popular wood of the Western Australian forests; and as the general purposes for which the wood is used are so well known, there is no need to give any detailed description.

Karri has very much the appearance of jarrah, so that it takes a good judge to distinguish them. "For lateral strength," said the late J. Ednie Brown, formerly Conservator of Forests, "it is very much stronger than jarrah, and for constructive works—bridges, floors, rafters and beams—it is of great value." He regarded it as more suitable for wood-paving blocks than jarrah, although he considered that in the main jarrah was the better wood. Both these trees occupy large and compact forest areas which greatly facilitate the operations of timber-getters. Jarrah covers about 8,000,000 acres and karri about 1,200,000 acres within a comparatively short distance of the coast, and in parts within easy access of railway communication.

Twart is one of the most valuable of all Australian woods, being the strongest and the toughest of them all. Unfortunately, the forest area of this excellent tree is so limited that only export trade could be done with it.

Red Gum has, however, a very wide range, and is a strong and useful wood. Its usefulness is occasionally impaired by the numerous gum veins which intersect it in every direction and from which the gum exudes in considerable quantities. But this product has its commercial value, as it possesses important medicinal properties and is used locally for tanning purposes.

Wandoo is a wood that needs to be better known. It covers a considerable area, and it is computed that there are from six to seven million loads of marketable timber available for use or export. It is well suited for railway and wheelwright work.

Blackbutt is also worthy of attention, as it is not only useful for wheelwright and waggon work, but, according to Mr. Brown, would make an excellent paving wood.

York Gum, another widely-distributed timber is a strong, tough wood suited for general purposes. The same also may be said of the *Yate Gum* and other eucalypts of this nature, of which this State and Australia generally possess a great variety.

Wattle.—A passing word should be said on behalf of the wattle, the general term throughout Australia for the large family of acacias. The well-known *Raspberry Jam* is a beautiful wood suitable for cabinet work. Another acacia, the *Badjong*, or wattle gum, is suited for barrel staves and for soft wood turnery.

Then there are the *She-oaks*; the *Banksias*, of which there are many varieties, some of which are specially suited for decorative work; the *Native Pines* (conifers), the leading member of which is the well-known Cypress pine, which is useful for house- and boat-building, furniture and fancy work; and the *paper-barked tea tree*, the wood of which is suitable for shipbuilding and the bark for fruit-packing.

Before concluding my reference to Western Australia I think it necessary to say a word or two about the special trade which that State has succeeded in creating in the matter of paving woods. It is now thirteen years since the first serious trial of jarrah wood blocks was made in the streets of London, when a section was laid in Westminster Bridge Road. Since then many miles of jarrah and karri have been laid in the metropolis, in provincial towns of the United Kingdom, and on the Continent of Europe. Other Australian woods also have been tried. Among these are blue gum and stringy bark from Tasmania, crow's ash and tallow-wood from New South Wales, blackbutt and bloodwood from Queensland, ironwood from New South Wales or Queensland. No settled or systematic effort appears to have been made, however, to popularise these woods. Indeed, from the fact that some of them were exported in an evidently unprepared state, it would seem that the conditions of the trade were not carefully considered by the first exporters—to their disadvantage and to the discouragement of further efforts.

Views & Reviews.

A New Handbook for Builders.

This is the first issue of a book which we assume is proposed to be published yearly by the London Master-Builders' Association; but it is intended for circulation among the principal persons connected with the building trade of London, and is not confined to those who are members of the Association. We can hardly see the need for such a book. It supplies a great deal of interesting information, but this is also given in several other books popular among builders, and there is certainly much extraneous matter in the handbook, for we cannot conceive why there should be any reference to marriage with a deceased wife's sister; why space should be devoted to postal reform, to old-age pensions, or to the sale of liquor to children; or for what purpose the features of the Coronation service are mentioned, or why a sketch of their Majesties' lives is included. The book furnishes full particulars of the Association itself and also supplies useful information about working rules, the London Building Act, the government of the metropolis, housing, water, the law relating to trade-unions, and various weights and measures. Thirty-three pages (taken from another work) are devoted to timber tables. The summarised particulars with regard to patents, designs and trade-marks are correct, the electrical memoranda is clearly set forth, and doubtless the full statement of the London water companies' requirements will be useful; but, on the whole, the book impresses one as being unsystematic; moreover there is surely a want of foresight in giving the building contract that occupies almost seven pages in the first part of the book and then filling twelve pages at the back of the book with the new building contract, which is the one now in use and not that first mentioned. In conclusion we may note that in the "general contents" "district surveyors' address" is twice printed instead of "district surveyors' addresses"; also that the designer of the new War Office is dead and should therefore be referred to as "the late" Mr. William Young; and that the new cathedral at Westminster occupies a site and not a "sight" (p. 134).

"Handbook of the London Master-Builders' Association, 1902," edited by J. William Ritchie. Published by the Association at 31, 32, Bedford Street, Strand, W.C. Price 5s.

Engineering Chemistry.

The title of this book is misleading. Instead of dealing with the principles of chemistry as applied in engineering and with the materials used, as would be supposed from the title, it merely deals with methods of analysis of some of the materials employed in engineering, namely, metals, ores, limestones, fuels, water, oils, grease, gasworks products, disinfectants, explosives, &c. The book contains much useful information, but it would have been of greater use in the laboratory if it were more summarized. Much space could be economised if tabular arrangements were often adopted, and even the explanations are somewhat verbose, for a trained chemist (for whom the book is intended) will not need so much repetition; such statements, too, as "Iron, in its various forms, such as cast-iron, malleable iron and steel, is the most serviceable and largely used of all the metals" are out of place in a book of this advanced character. The principal addition to this third edition is an illustrated section on the microscopical examination of iron and steel, particulars of Hampe's method for estimating oxygen in copper, Hehner's bromine thermal test for oils, the Pensky-Marten's flash-point apparatus, Redwood's apparatus for testing air for inflammable vapour, the fluidimeter, and the Home Office tests for determining the stability of explosives.

"Engineering Chemistry: A practical treatise for the use of Analytical Chemists, Engineers, Ironmasters, Iron-founders, Students and others," by H. Joshua Phillips, F.I.C., F.C.S. Third Edition, revised and enlarged. London: Crosby Lockwood & Son, 7, Stationers' Hall Court, Ludgate Hill. Price 10s. 6d.

A Friendly and Trade Societies' Hall at Derby is being erected at the junction of Normanton and Burton roads, from plans by Mr. A. Macpherson, at a cost of about £10,000.

THE DINNER TO M. RODIN.

ON Thursday evening last M. Rodin was entertained by the committee of the Rodin Statue Fund at a banquet at the Café Royal, arranged by Mr. John Tweed, the well-known sculptor who has just completed his statue of the late Mr. Cecil Rhodes. The Secretary for Ireland, Mr. George Wyndham, M.P., presided, and among those present were the French Ambassador, Lord Windsor, Lord Balcarras, Lord Ribblesdale, Sir Charles Dilke, M.P., Sir Walter Armstrong, Sir L. Alma-Tadema, Prof. W. P. Ker, Messrs. E. W. Beckett, M.P., W. J. Bull, M.P., B. F. Hawksley, T. Brock, R.A., John Sargent, R.A., C. H. Shannon, D. S. MacColl, W. Heinemann, Frank Baden-Powell and Hain Friswell. Mr. Whistler was one of the few artists who were unable to accept the invitation, but in a letter regretting his forced absence he sent his greetings to "my friend and distinguished confrère."

The chairman, in proposing the health of their guest, said that whilst the French Ambassador represented the power of France, M. Auguste Rodin represented the glory of France. In respect of modern sculpture, and above all of modern French sculpture, people in this country had to deal largely with Faith without Works. Imagine the situation of a young British sculptor. He had in the British Museum an incomparable treasure-house of Greek masterpieces. He had in South Kensington many reproductions of Greek sculpture and of Renaissance work, including some reproductions of that truly great master Jean Goujon; but coming to modern French sculpture, what had he? One cast of Barye; a small torso of Le Gros; nothing of Houdon, of Carpeaux, of Puget, of Rude; and, until this movement nothing of Rodin. He hoped that next year they would be able to get together a collection of Rodin's masterpieces. People would assure one gravely that they were devoted to sculpture, and yet it would only be found that they had made one trip to Italy, combined, it might be, with the distractions of a honeymoon. M. Rodin, in common with the greatest artists of all times, was in his art intellectual, but not literary. He worked with the human brain and the human hand to discover the mysteries of form and light muffled beneath the brute objectivity of matter. He was the strenuous and perfect workman knowing all there was to know of the truth, and therefore of the beauty, and therefore of the power of the human form; knowing too all there was to know of the aptitude of clay to receive, of marble to declare, his own intimate interpretation of those large secrets of the universe which escaped the narrow definition of logic and language. "Nous allons boire au maître—à Auguste Rodin," added Mr. Wyndham, amid loud cheers.

The Speech of the Guest.

In acknowledging the toast M. Rodin, speaking in French, said: "In the course of my life I have passed through both troublous and happy moments. To-day I am enjoying one of the happiest. Your generous welcome moves me deeply. Some twenty years ago I came to London, and even at so early a period I experienced at English hands a kindly consideration of which the memory is still green. Your beautiful museums, with their marvellous collections, Greek, Assyrian and Egyptian, awakened in me a flood of sensations, which if not new, had at any rate a rejuvenating influence; and those sensations caused me to follow nature all the more closely in my studies. I felt more imperatively than ever that in order that my productions should not prove barren, it was necessary, if I sought to give them the vivifying spirit which engenders emotion, to go to nature, the only model whose variety can never stale, whose unforeseen and sublime revelations rise superior to all efforts of our imagination and in which are embodied all styles, past, present and future. The Greeks have successfully presented human beauty in its highest form, for, when wrought in all sincerity, the counterfeit presentment of man becomes divine. Never can we too strongly realise that all that is nature is beautiful. But we, who live in the very bosom of this beauty, we more often do not feel it, for man is unable to discern it. After having studied the Greeks, those powerful

pioneers, after having feasted our eyes on their masterly sculptural and architectural productions, immortalised by them in marble, and so delicately expressed in their Tanagras, much more remains to be done. It is only by dint of strenuous and persevering toil following upon prolonged and passionate contemplation of nature that a new world unfolds itself to our gaze. So it is that our vision of everyday life, generally looked upon as commonplace, becomes as it were enlarged, and we consider beautiful all beings surrounding us, whether they be friends or enemies. From that moment we do not cease to admire, and we are once and for ever initiated into the joy of fervently loving nature, all-absorbing and voluptuous nature. The humble sculptor then becomes in his turn the mirror of nature, an artist who, as malleable as wax, retains nothing of its own personality, and is merely the docile instrument which a superior instinct governs at will. I close, craving the indulgence of the eminent men who surround me for this my declaration of faith. Even if I am mistaken I have thought it my duty to give utterance, out of gratitude for the interest they have shown me, to my thoughts in regard to art. I thank you most cordially for subscribing to the purchase of my St. John the Baptist for the Victoria and Albert Museum."

Engineering Notes.

The Embankment Tramway has been sanctioned from Westminster to Waterloo Bridge.

An Electric Trolley Omnibus Line is to be constructed between Bunnan, Gersau, Vitznau and Weggis, on the Lake of Lucerne. The motor-omnibus will be fitted with pneumatic tyres, and will run on the high roads without rails, deriving its power from an aerial electric cable.

The Andrew Carnegie Research Scholarships.—The Andrew Carnegie gold medal for 1902 has been awarded by the Council of the Iron and Steel Institute to Dr. J. A. Mathews, of New York, for the research carried out by him as a holder of an Andrew Carnegie Research scholarship during the past year. The medal has been designed by Mr. G. W. de Saulles, of the Royal Mint. The first recipient, Dr. Mathews, has previously received a Fellowship for the encouragement of scientific research from Columbia College, New York, where he has been working under the guidance of Prof. H. M. Howe. For the present year the Council of the Iron and Steel Institute has awarded six Andrew Carnegie Research scholarships, each of the value of £100. The following are the successful candidates:—Octave Boudouard, of Paris, aged 30, has already published thirty-two original memoirs and, in conjunction with Prof. Le Chatelier, four books. He is Assistant Professor of Chemistry at the College of France, and has previously received in France bronze and silver medals for research. William Campbell, of New York, aged 25, has published papers for the Institution of Mechanical Engineers, the American Chemical Society and the Franklin Institute. He studied at the Durham College of Science, and was awarded an 1851 Royal Exhibition scholarship to the Royal School of Mines, London. He is now working under Prof. H. M. Howe at Columbia College. Alfred Campion, of Cooper's Hill, aged 27, is a member of the Iron and Steel Institute, who has had practical experience with the Steel Company of Scotland, and has previously written papers for Glasgow societies. Percy Longmuir, of Manchester, aged 25, was a student of the Sheffield University College. He has had experience in foundry work and has written several papers on that subject. Ernest Schott, of Berlin, aged 26, studied under Professor Ledebur, of Freiberg, and is assistant in the Royal Testing Institution at Charlottenburg. He has published a number of original memoirs. Frederick Henry Wigham, of Wakefield, aged 32, is a member of the Iron and Steel Institute. He is steel works manager to Messrs. George Cradock & Co., and communicated, in conjunction with Mr. Stead, a paper on steel for wire-making to the Iron and Steel Institute last year.

Major Davis, city architect of Bath, died recently. Major Davis had a long career of valuable civic work, his official connection with the Council having begun in April, 1862.

Correspondence.

South Kensington Examinations in Building Construction.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, N.

SIR,—As a candidate in the recent examination in Building Construction, I read with interest the model solutions to the Elementary questions published in your issue for May 7th, and, as a builder, I must take exception to some of them. Solution 3 needs no comment, as you acknowledge its imperfections. Solution 6: You hole the slates in such a manner that, in fixing, the nails would not clear the slates below. The answer to question 8 is surely a clerical error; no one who understands bonding would break the transverse joints. Solution 9 is a very bad example of sneaked rubble. Solution 13 is an exhibition of ignorance of bonding. I consider journals such as yours should be very careful not to mislead students. There are other points upon which no doubt you will have further correspondence. I shall esteem it a favour if you will kindly insert this letter in your journal.—Your truly,

CHARLES F. PARSONS.

[Our contributor is pleased that he forestalled some criticisms by his "note" to question 3. To a book question a book answer may be given, and all has then been said, but questions of practice allow of some controversy. Question 6: The drawing shows a clear 14in. from the bottom edge of the hole to the nail, and there are no grounds for saying that the nail will come upon the head of the slate beneath. Question 8: Our contributor has not been quite so successful in avoiding criticism as in 3. He should have looked up the books, and he would have found very good reason for not breaking the cross joints: he has now to give reasons for breaking them. It is said by an authority that he holds in the very highest respect (Rivington's Notes, Vol. I., page 20): "This has, however, been objected to on the ground that in bad work . . . the rain may be blown through," &c. He can only say that in good work, that is, when a wall of this thickness is built with cement-mortar, he, rightly or wrongly, bonds in the way shown in the solution and he believes it to be a good plan. There remains the criticism of question 13. Candidates are asked to solve a definite problem. The solution given is a perfectly sound one. We take in good part the advice to observe proper care in regard to our reputation. We do the best we can. Our contributor passed the Honours stage twenty-eight years ago, and he has been in constant building practice ever since. We hope that our correspondent will take a first-class, even if some of his answers differ from our model solutions.—ED. B.J.]

WONERSH CHURCH.

THE parish church of Wonersh, near Guildford has been restored under the supervision of Mr. Charles Nicholson, of the firm of Nicholson & Corlette, architects, Lincoln's Inn, W.C. The nave has been refitted, and no attempt has been made to alter the character of the Georgian work. The old round-headed windows are preserved, and the interior brightened by the removal of the flat ceiling and gallery. The old high pews and the gallery front have been utilised as a dado round the nave, which has been re-paved with stone and re-seated in carved elm. On the north side a window has been filled in. The walnut pulpit, of eighteenth-century character, has been carved by Mr. C. Ede, of Bramley. The tower has been opened into the nave, this having been effected by utilising the twelfth-century arch, which had been blocked up for many years. The Grantley chapel has been restored in much the same manner as the nave. It has a flat panelled ceiling of elm, and the old tombs have been re-set. A portion of this chapel has been screened off with panelling to form a vestry. In the chancel, north chapel and tower it was considered that the remains of the mediæval building were sufficient to warrant a restora-

tion more or less on the lines of the church as it existed before the end of the eighteenth century. The east end of the chancel had been destroyed and replaced with a small dark apse, but its side walls remained, and the pitch of the old roof was ascertained by marks on the wall over the chancel arch. When the apse had been removed and the excavations for the new east wall of the chancel dug, it was found that they exactly coincided with the ancient foundations of the thirteenth-century chancel. There were also discovered the remains of a crypt, which was probably an old treasury, and here many of the thirteenth-century tiles may be seen in an excellent state of preservation. The east window follows the general lines of that which existed in the eighteenth century, but there were no data sufficient to enable the architect to exactly reproduce the old details. The new window, therefore, has been designed on simple lines, and is of rather late Gothic character, in order to show clearly that it is an insertion and to avoid falsifying the history of the building. The chancel is ceiled with a parallel cove of elm; the ribs have forty-two bosses at their intersections, carved, painted and gilded, and the ribs are decorated in colour. There are chalk sedilia and piscina with credence, all new. Two old "squints" have been found in the chancel walls, and these have been reopened. The floor of the chancel is paved with marble. Fragments of two old screens were found in opening out the side arches of the chancel. These are of plain fifteenth-century character. Many interesting fragments have been found under the floors. Among these are portions of the Norman font, the base of which has been replaced and the bowl copied. The general contractors for the work are Messrs. E. & J. H. Holden, of Cranleigh, whilst the new heating apparatus is by F. Edwards & Co., the new marble floor by Van Straaten, and the altar hangings by Watts; all of London. The window in the nave is by Mr. J. Fisher, of 30, Little Britain, and the carving by Mr. H. K. Kuchemann, of Shepherd's Bush.

COLCHESTER TOWN HALL.

THE new town hall at Colchester, designed by Mr. John Belcher, A.R.A., was opened on Thursday last by Lord Rosebery. The building, exclusive of the site, has cost £55,000, of which more than £12,000 has been given by townspeople and others. It is now more than five years since the building was projected. In the year 1897 Mr. Belcher's designs were selected in public competition, of which Mr. Norman Shaw, R.A., was the assessor. In October, 1898, the foundation-stone was laid by H.R.H. the Duke of Cambridge, and the contractors (Messrs. Kerridge & Shaw, of Cambridge) commenced to clear the site and lay the foundations at the beginning of the following year. Of the many gifts that have been made, the most important is the Victoria Tower, which was presented by Mr. James Paxman, C.E., a former mayor of Colchester. This tower is surmounted by a figure of the Empress Helena, who, from very early times, has been closely associated with the town. Four bronze ravens (designed from a drawing by Mr. F. Carruthers Gould, and emblematic of the Port of Colchester) are placed below, while at the lower angles of the tower are four figures representing Engineering, the Fishery, Agriculture and Military Defence, which figures have been sculptured in Portland stone by Messrs. L. J. Watts, Ltd. The Victoria Tower is 162ft. high and cost £3,000. The clock and bells in the tower, the marble statues on the outside of the building, the two lamp columns and the gates at the main entrance, as well as several windows, are also gifts. The new building contains ninety rooms, including rooms for entertainments, public meetings, courts for the administration of justice, office for the town clerk's and committee clerk's department, &c. The law courts are panelled and fitted in oak. The main staircase is of marble, the treads of smooth white, the balusters of polished white, richly veined with black, the coping of the balusters of black polished marble, and the larger columns of a red Italian marble—altogether producing a very handsome effect. This staircase was built with the help of an anonymous gift of £1,000. The council-chamber is elaborately carved and em-

bellished with stained-glass windows, the decoration of the ceiling having been skilfully carried out by Mr. Charles Baskett and Mr. Charles Baskett, junr., from suggestions supplied by the architect. One of the most interesting apartments in the building is the north committee-room, which has an imposing chimney-piece made by Mr. W. R. Simkin, of Colchester, of oak taken from the old town hall. The moot hall, or principal assembly-room of the building, has a fine organ at its west end, built by Messrs. Norman & Beard, of Norwich.

Builders' Notes.

Mr. Andrew Carnegie was last week presented with the freedom of the Worshipful Company of Plumbers at the Guildhall. A casket of silver, steel and lead was handed to Mr. Carnegie, and the key to Mrs. Carnegie. Mr. Carnegie, in acknowledging the presentation, said the work of conscientious distribution was much more difficult than that of acquisition. He regarded prevention as better than cure, but the great principle was to help those that helped themselves. As a man who had worked with his hands it was a matter of great satisfaction to him to receive recognition from a working company.

Birmingham University: The Quantities for the New Buildings.—"An Architect" objects, in the "Birmingham Gazette," that the preparation of the quantities for these buildings should have been placed in the hands of a firm of London surveyors. He says: "Considering that the Birmingham ratepayers are providing several thousands of pounds a year for the University, and that Birmingham people contributed so liberally to the endowment fund, and also that the Birmingham architects were most unaccountably refused a chance of competing for the architectural work, it would surely have been only reasonable that as much of the other work as possible should have been given to Birmingham men, who are quite capable of performing it."

London County Council.—At last week's meeting of the Council the Improvements Committee reported that they had decided that a site occupying roughly the centre of the open space in the Strand between St. Clement Dane's Church and the eastern horn of the proposed crescent block would be the most suitable for the Gladstone Memorial. A long report regarding the widening of Piccadilly near the Circus was brought up by the same committee. Captain Hemphill said he learned that four houses had recently been leased to the St. James's Hall Co. for the extension of the hall. This was a matter of deep regret, for it had delayed the widening of this portion of the thoroughfare for eighty years, unless, of course, an agreement could be come to with the directors of St. James's Hall. The Council adjourned until June 10th.

Quantities in Contracts.—The Midland Counties section of the National Federation of Building Trade Employers held a meeting at Wolverhampton last week under the presidency of Mr. James V. Porter (Derby). The executive council in a report called the attention of all employers connected with the building industry to the case of *Ford & Co. v. Benrose & Sons* (reported on p. 85 of our issue for March 26th last), which was recently decided in the Court of Appeal, and in which the judgment declared that inasmuch as the bills of quantities did not constitute a specific part of the contract the builder was only entitled to payment on the basis of a "lump sum" contract, and not for actual work done necessary for the full completion of the building according to plans. The case, it was pointed out, was one of far-reaching importance, and in the interests of building contractors it was thought desirable to carefully consider whether the decision of the Court of Appeal ought not to be taken to the House of Lords for a final review. Under any circumstances, the National Federation felt justified in ventilating the question in the interests of an industry in which considerably more than £60,000,000 annually was paid in wages. Reports from the associations affiliated with the Federation showed that the building trade of the country was far from brisk.

DRAINAGE.*

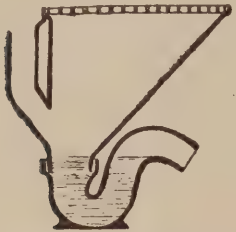
By W. ELGIE BLAND, F.I.S.E.,
Assoc. San. Inst., R.P.C.

DRAINAGE should be considered in conjunction with plumbing work. The two subjects are, however, too extensive to treat in a short paper, and I will therefore endeavour to keep to the drainage as far as possible, under various headings.

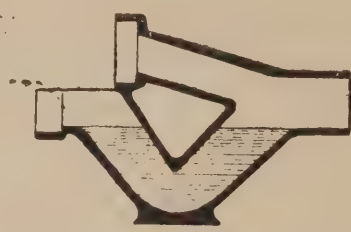
Cause of Defective Work.—By far the majority of drainage systems are badly installed, chiefly because they are entrusted to men who have really no educational training or knowledge of the principles underlying the work; indeed, the handy labourer's only recommendation is that he does not mind a dirty job, and can excavate.

Material.—The question as to the most suitable material for drains is one that still causes much discussion. The glazed fireclay pipe is undoubtedly more used than any other, but this does not necessarily mean it is the best for the work though it may be on account of its cheapness. If a proper foundation is prepared of concrete to proper gradients, and a selected "glazed" pipe used and carefully centered and jointed, a good and permanent job may be obtained. It is, however, the exception—I might say the *rare* exception—to find this done; indeed, the larger number of pipes made have not a socket or spigot suitable for making a secure joint. Often the sockets are too small to receive a round of tarred yarn, without which you can never rely upon the pipes being properly centred in the sockets. Again, they are frequently glazed over the spigot and into the sockets, and are not sufficiently serrated

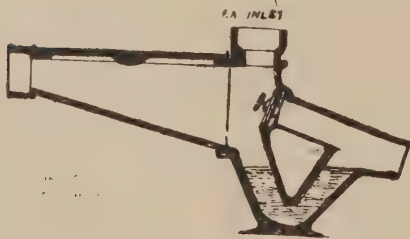
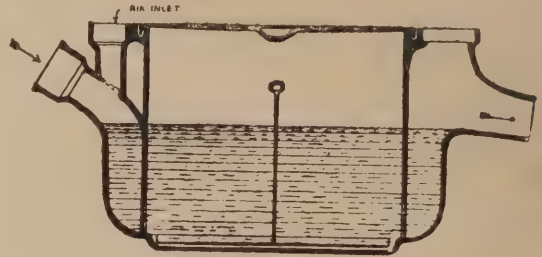
bore pipes should be used, and particular care should be taken to have this clearly stated in the specifications, as the water-main pipe is considerably cheaper, and to my own knowledge is being largely used in this district. The same remarks apply to the fittings. They should not be less than $\frac{3}{8}$ in. thick, and should be properly coated with a non-corrosive solution, or, better still, glass-enamelled inside and coated outside. They can be jointed with tarred spun yarn and molten lead, carefully caulked up, or with rust joints; the former, however, is preferable, as it will allow of slight movement without in any way affecting the joint, and if the socket is properly coated there is no fear of any action setting up between the lead and iron. The pipes can be obtained in 9ft. lengths, and when properly jointed will stand a pressure of 200lbs., and this is their strong recommendation, for well-laid fireclay



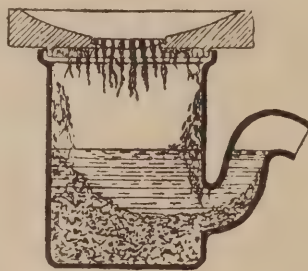
GULLY TRAP (Clean flushing)



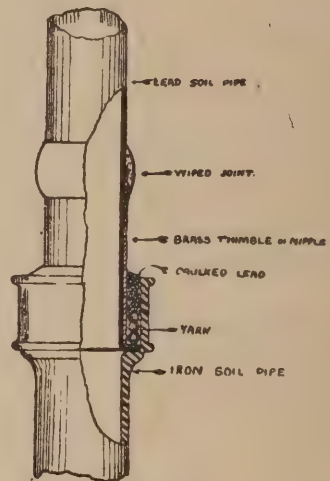
DISCONNECTING TRAP
(Badly designed—no full at inlet provided)



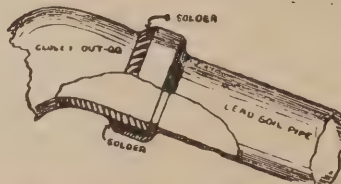
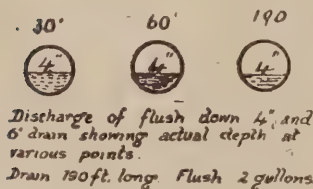
BLAND'S CHAMBER TRAP (Registered No. 325,966)



FILTH COLLECTOR



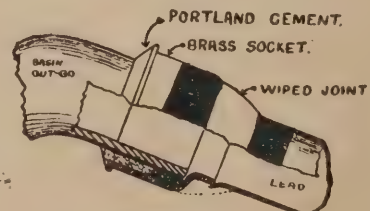
BRASS THIMBLE CONNECTION



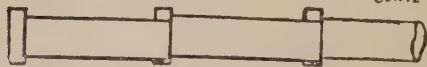
PORCELAIN AND LEAD SOLDERED JOINT



CURVE MADE WITH STRAIGHT PIPES



BRASS SOCKET & CEMENT CAULKED JOINT



JOINTS BADLY CENTERED

He is quite ignorant of plans, and the questions of falls, angles, gradients, caulking of pipes, &c., never come into his calculations at all. His usual instructions are received from the general foreman, who may be a mason or a joiner. Architects are also sometimes responsible for defective work by not preparing *separate* detailed plans of drainage. I think it of the greatest importance that a careful and accurate plan should be prepared of drainage work, clearly indicating the various sizes of mains and branches and "their respective gradients," sections of the various traps and gulleys, positions of inlet and outlet ventilation, and method of securing proper foundations, &c. This plan should be kept as a record in case of future alterations or additions.

or roughened to enable the cement to effectually key itself. The pipes are often curved and porous, and are rarely tested before leaving the manufacturers. The practice of cutting pipes and trying to make a secure joint on the glazed surface is sure to prove dissatisfactory under the water test. Short lengths from 6in. to 1ft. 9in., with properly prepared spigot ends, should always be provided. The fact that it is difficult to burn a straight pipe longer than 2ft. to 2ft. 6in. is greatly against their use, as they are practically all joints. Iron drains are daily becoming more popular, and, in my opinion, deservedly so. At the same time there is a great risk of their being condemned on account of the large quantity of iron water-main pipes that are being laid for drain pipes. This is a serious mistake, as water-main pipe, though smooth enough to pass clean water, is quite unsuited for passing sewage. Only specially-cast smooth-

drains when subjected to pressure to relieve a stoppage are liable to have their joints forced, and become defective and leaky, a trouble that could not occur with a well-laid iron drain. If you compare the cost of a glazed fireclay drain, properly laid on concrete by skilled labour, with a cast-iron drain laid on clay, you will find very little difference.

Foundation.—This is important, but usually neglected, more drains being laid on soil, sand or gravel foundations than otherwise. Unless you can obtain a firm clay foundation, a bed of concrete of varying thickness to suit circumstances should always be adopted, otherwise the drain is sure to leak in course of time. I have even experienced this result on a firm clayey foundation a few weeks after filling in, and could only account for it through the shrinkage of the clay through exposure to air and sun whilst open and its swelling from moisture after filling in,

* A paper read before the Northern Architectural Association (Students) on February 19th, 1902.

part of the drains being below the cement and part below the garden ground. There is not the same necessity for so firm a foundation for iron pipes as for those of fireclay, as the former are longer, joints more pliable, and the strength much greater.

Sizes.—The size of drains needs more consideration. It has always seemed strange to me that 4 in. branches should be taken from a 4 in. main. Surely if 4 in. is large enough to carry the whole requirements of the house, the branches should be reduced to their required sizes. For instance, why should a branch receiving the 1½ in. discharge from a lavatory or the 2 in. from a bath be increased to 4 in. in the drain and gully? I am confident 2 in. and 2½ in. respectively would be ample and would keep cleaner and be less costly. It is simply the conservative habits the manufacturers get into, assisted by oftentimes absurd municipal by-laws. Take Newcastle for instance. The Corporation stipulate a 6 in. drain as a minimum, while the water company stipulate a 2-gal. water-closet flush as a maximum; yet both know that a 6 in. drain cannot possibly be kept clean by a 2-gal. flush, with the result that the many thousand closet vent-pipes in and about the city are omitting foul gases which might be avoided. A 4 in. drain is quite large enough for a very large villa residence: 3 in. and 2 in. branches would be also quite large enough for the rainwater and bath discharges. See that your main disconnecting trap is small enough to be kept clean regularly by the ordinary use of the drains, and allow for full-sized ventilating pipes throughout. Let it be a rule never to use a drain larger than is absolutely needed, for the smaller the drain the better hydraulic depth you can obtain to float the solids down to the sewer (see accompanying illustration of 6 in. and 4 in. pipes). Always bear in mind that you are using water as your carrying medium, and the deeper the water in the drain the better for this purpose. The further advantage of a regular displacement of the air of the drain by mechanical means is valuable, as I fear vent-pipes are not always so reliable as one assumes.

Jointing.—The proper jointing of drain pipes is of the greatest importance for the following reasons:—If the drains leak the water (which is your carrying medium) escapes, and the solids are stranded and remain in the drain to putrify unless removed by some specially large flush from a bath, or by storm water. In any case the drains are always dirty and liable to stop up. You can readily imagine how easily 2 gals. of water will leak from a defective drain. Proper jointing is also of great importance because most buildings get a large portion of their ventilation through the surrounding ground, which should therefore never be contaminated by sewage from leaky drains. In jointing glazed pipes, tarred spun yarn should always be used, drawn through liquid cement before being caulked in; the socket is then well filled and caulked with cement (old preferred, new being liable to swell) and clean sharp sand in the proportion of ½ and ¼. Great care should be taken when putting in the spun yarn to ensure the centering of joints, as badly-centered joints always mean dirty, if not, choked drains; and the cement should be carefully trowelled to a surface all round, at the bottom as well as at the top. It is almost impossible to rely upon a joint on a cut pipe having a glazed spigot; short, properly-prepared pipes should always be used. In cutting iron pipes a proper cutter should be employed in preference to a file, as a roughly-cut end without any bead is liable to allow yarn to be caulked through, and the lead to follow it, with disastrous results. Lead joints should always be well caulked.

Installation and Arrangement.—There are three important points to keep in view in arranging a drainage scheme. First, be sure that the drains are securely and permanently disconnected from the common sewer, and your house from the drains. Secondly, arrange the system so that thorough flushing is secured throughout, which will keep the drains clean. Thirdly, obtain a free circulation of air throughout the whole system, including the branches if they are long; which will ensure a fairly pure atmosphere, even from the ventilating pipes, and in case of accident the risk is reduced to a minimum.

Disconnection.—The fact that disease germs

do exist in sewage and are liable to make their way into your house drain suggests the wisdom of disconnecting each house from the common sewer. We should see that our homes are guarded against dangers from below ground as well as from above. A main disconnecting trap is therefore necessary, and should be placed as near the boundary as possible, not close up to the house, as is frequently done. A good form of trap should be selected, because the discharges are usually sluggish and shallow at this extreme end of the system, and the less the resistance to be overcome at this point the better. I have found a V-shaped trap best, because it contains the least quantity of water possible to give the desired seal of from 2 in. to 2½ in. (necessary to resist the back-pressure from sewer), but the difficulty I experienced in obtaining what I desired for this position led me to design one for myself, an illustration of which I give (Cameron & Robertson): the object is to concentrate the energy of the flush to act with the best force obtainable to overcome the resistance caused by the water in the trap. The channel is narrowed to give depth, inclined to give velocity, and a fall or weir provided giving a vertical drop of from 3 in. to 4 in. into the standing water. The whole is cast in two pieces, with bolted and faced joint, which cannot get misplaced.

Open channels in inspection chambers are objectionable: they are like so many foul air shafts, with supposed air-tight covers, which are never air-tight at all. Frequently more chambers are provided than there is any need for, and they are often placed in positions where they are as objectionable as an open drain would be. Indeed, I prefer all chambers with the drains closed at the bottom with bolted covers; there is then no need for air-tight covers at the top, the chambers being only for inspection and clear of any foul air. Should, however, the open channelled chamber be adopted, see that it is properly formed, and that the channel is provided with vertical sides to a height of about 3 in. above the top of the highest inlet pipe feeding same before the sloped benching starts. Hundreds are formed with flat benching level with the half channel, and become filth collectors. Also see that the fresh-air inlet pipe is carried from the top of the chamber. I was recently testing the drains of a large house where this pipe was taken from the bottom, and it was half-choked by solid sewage. The greatest care should be taken with the brickwork of such chambers, which should always be built in cement and never be less than 9 in. thick.

Gully and Waste Traps.—It is still the practice to put the old filth-collecting gully round about many modern houses, the original idea being to collect the filth and stop it choking the drains. There is never any necessity in an average dwelling (though it is sometimes desirable in large hotels where a great quantity of greasy matter has to be dealt with) to provide anything in the way of collection for sewage. The proper receptacle for sewage is the sewer, and anything that will pass your gratings and traps should be easily floated straight into the sewer, provided the drains are properly laid. The system of fixing so many little cesspools round about a house cannot be too strongly condemned. Therefore adopt in all cases a round-bottom trap that will clear itself with each flush; and discharge the inlet directly into the trap in such a manner as to bring the greatest force to act upon the drain. This cannot be obtained if you discharge your pipes over a grating, which breaks the force, and goes down the drain in a dribble.

I have illustrated several gully traps, good and bad; a safe rule is not to have any trap larger than will secure the full water-seal required.

Evaporation and Syphonage.—It is often thought that, so long as a trap is provided, safety is secured. This is very erroneous and leads to a feeling of false security. In dry weather the water will quickly evaporate from a trap to a sufficient extent to break the seal. This frequently happens to gully traps fed only by rainwater and traps put on the overflow from rainwater tanks.

I do not at all agree with the system of putting gully-traps at the bottom of rainwater pipes and connecting them direct with the sewer drain. In my opinion it is always safer to run

a separate rainwater drain without gulleys, and cut it off by a suitable trap before being connected to the sewer drain, care being taken to ensure that this trap is charged during droughty weather by some regularly-used fitting (such as a lavatory) and that an efficient circulation of fresh air is obtained throughout this rainwater drain.

Overflows from rainwater tanks below ground should never be connected to a drain except through a trap fed by some other fitting in regular use.

It is much better to run a separate rainwater drain with only foot-shoes and rust-pockets, cutting off this drain by a single trap before it joins the sewer drain, and taking special care to ensure that this trap is fed by a lavatory or similar fitting to guard against evaporation in summer. This enables free ventilation and does away with any risks. I may add the opinion that far too many rainwater-pipes are provided to most houses. They are often unnecessary, and only spoil the elevation by their unsightliness.

Syphonage is also an item to be reckoned with in drainage, and more particularly where small pipes are adopted. This occurs by the velocity of a discharge sucking the air from a branch pipe and causing a vacuum in this pipe, which is immediately filled by the atmospheric pressure forcing the water through the trap and rushing in to replace the air abstracted. This can never occur, however, in a properly-ventilated drainage system.

Flushing.—Perhaps the best way to flush the drains of an average dwelling is by means of the bath discharge. Take every care, therefore, to give the bathroom a position as near the head of the system as possible, and see that the waste-pipe is not less than 2 in. from feed by a large waste outlet. Discharged once and sometimes twice daily, this flush is most effective.

Other means, such as collecting your rainwater into automatic flushing tanks, can be adopted, but to place such a tank at the top of a system throws the drain fairly deep at its outfall and adds seriously to cost. Regulate the flush by the fall; for instance, a closet discharge should never have too much fall, or the water will run quickly from the solids, leaving them stranded. On the other hand, a rainwater or bath branch can be run at a fairly high pitch. It is as defective to give too much as too little fall to drains. About 1 in 40 for a 4 in. main drain and 1 in 60 for a 6 in. is a good basis to work upon.

Ventilation.—The proper ventilation of drains is sometimes difficult to deal with. It is affected by so many influences; for instance, an outlet vent-pipe on a south wall, with the sun's rays upon it, will give a better result than if on a north wall. Inlets should always be of the full size of the drain, as also should the outlets, and great care should always be taken to get a circulation through the whole system if possible. This will provide you against risk, even in the case of any of the traps failing or damage through accident. It will also prevent foul smells being distributed about the top of the house, which are pressed down to the window levels in heavy weather. Where a drain passes (through absolute necessity) below a house, it should be ventilated at both ends of the house right up to the roof. Never leave an outlet pipe near any inlet to a house, either windows, eaves or chimneys.

Inspection.—This appears to be so very simple that everyone thinks he can undertake such duties. There is, however, more in it than appears on the surface, and experience of a very varied kind is required before you can be sure of results. The pressure of wind over pipes; the saturation of fireclay material; the effect of tidal pressure; the forcing of traps, and escape resulting; the effect of a flush on smoke; the compression of locked air—all these affect a test. I have on occasions had to go two and even three times before I could be sure of my bearings. A connection to a rainwater tank below ground may upset your calculations completely. The only safe test for drains is, of course, the water test; if they will not stand this successfully, they are liable to be forced and ruined in case of the drain choking and filling up. A little extra head, say 20 per cent. more than actual pressure possible in ordinary use, would be an advantage. See carefully to overflows to underground tanks; they are dangerous.

Keystones.

The Church of the Ascension, Victoria Docks, which is the Felsted School Mission, is being erected.

New Parish Council Offices at Perth have been erected in York Place from plans by Mr. J. Marshall, architect. The contractors were:—Mr. Leith, joiner; Mr. R. Stewart, painter; Mr. W. Tait, mason; Mr. C. Alexander, glazier; and Mr. J. Sharp, plasterer.

Coronation Triumphal Arches will be erected at the Hyde Park end of Piccadilly (generally typifying the British Dominions beyond the seas), and at the point when Parliament Street enters Parliament Square (typifying the British Isles).

The Victoria Hall, Wallgate, Wigan, is now being erected. It will be of bricks, and is estimated to cost £800. The accommodation will be two dining halls for men and women, which can also be used for meetings. Messrs. Joseph Wilson & Co. are the builders, and Messrs. J. B. & W. Thornley the architects.

An Outdoor Pulpit in Piccadilly.—Dr. Tristram has granted an application made by the Rev. Canon McCormick, rector of St. James's, Piccadilly, for an outdoor pulpit, to be built as part of the church, facing Piccadilly. In decreeing the faculty the Chancellor said it would be an interesting revival of an ancient custom. There was a disused burial-ground adjoining the church, and he could not allow any erection which did not form part of the church. The pulpit would be part of the church building, and therefore he would not be contravening the Disused Burial Grounds Act.

A New Small-pox Hospital at Sheffield is being erected at the junction of Crimicar Lane and Redmires Road. The site is 1½ acres, but only four acres of the land will be taken up by the buildings, which consist of an administrative block, ward pavilion, isolation wards, laundry, mortuary and ambulance block, and lodge and discharging block. The plans have been prepared by Mr. C. F. Wike, the city surveyor. Mr. J. Fidler, of Eckington and Sheffield, is the contractor. The possibility that future extensions may be necessary has been considered, and the scheme provides for the erection of three more ward pavilions when desired. The cost of the hospital will be about £18,000.

The Parish Church of Lower Guiting, 14 miles from Cheltenham, is proposed to be repaired at a cost of about £1,000. It is of the Norman period and is in a very dilapidated condition. The chancel is in the worst condition. It is boarded off from the nave and in utter disuse. Before it can be used for public worship it must be re-roofed, re-floored and re-furnished, while the walls, now bulging from the upright, will have to be taken down and built up anew. About fifteen years ago a meritorious attempt was made to restore this portion of the sacred edifice. Scaffolding was erected inside and outside, but nothing more was done, and this eloquent testimony to the impecuniosity of the parish remains standing to this day.

Lodgement Infectious Diseases Hospital, Sheffield, is being extended by the erection of new permanent buildings. They are in plain stone, lined with brick, and will, it is estimated, cost £82,346. They include a waiting-shed for visitors to patients; a water-tower, with tank, to hold 12,000 gallons, the lower storeys utilised as living- and bed-rooms for porters; a pavilion for receiving patients, with a bathroom, &c.; two pavilions, with two beds each, for the isolation of special cases; six pavilions for twenty patients; separate wards for one and two beds, with kitchen and sanitary blocks, and with a large recreation-ground; a covered recreation ground; administrative buildings at the front; administrative buildings at the back; dispensary and laboratory; nurses' home, maids' home, store for patients' hospital clothing, and sewing room; covered boiler-house, stable building and ambulance-shed, with coachman's house above; mortuary. Including the temporary buildings, the total accommodation is for 266 patients, and with the staff for about 410 persons. Messrs. Gibbs & Flockton, of St. James's Row, Sheffield, are the architects, and Mr. T. Roper, of Sheffield, is the contractor.

The Competition for an Isolation Hospital at Hay, Brecon, to be built of stone, has been decided in favour of Messrs. Davies & Maltby, architects, of Hereford, who have been awarded the first premium.

A Refreshment House on the Thames Embankment is to be erected by the London County Council at the Charing Cross end of the Embankment Gardens. The buffet inside will serve refreshments automatically.

Fordington St. George's Church is proposed to be repaired and improved from plans prepared by Mr. W. D. Caroe architect to the Ecclesiastical Commissioners. The work proposed includes repairs to the tower and belfry, the construction of vestries and organ-chamber, and a new and larger aisle in place of the present north aisle and gallery, general repairs throughout, including a new floor, and the provision of an efficient heating apparatus. It is estimated that an expenditure of rather more than £3,000 will be involved.

The King's Memorial to Victoria.—A stained-glass window has been placed by the King in the Private Chapel at Windsor Castle as a memorial of her late Majesty Queen Victoria. The window consists of ten lights in two tiers above the altar. The whole memorial is extremely rich in design, and is architecturally canopied in harmony with the style of the chapel. The window is the work of Mr. Ion Pace, who made several of the windows in St. George's Chapel, and also in Whippingham Church, Isle of Wight, for the late Queen. A tablet designed by Mr. A. Y. Nutt, architect at Windsor Castle, has been affixed to the oak panelwork near the window, recording the memorial.

St. Catherine's Church, Horwich, situated on a site near Chorley New Road, was opened recently. It consists of a lofty nave, side aisles, vestries and temporary chancel. Transepts, side chapel, chancel and east end will be added at some future time. The present part provides about 600 sittings. In the basement a large parish room is provided. Externally the building is built of local bricks with red Ruabon terra-cotta dressings and North-country green slates, with red ridge. The windows are filled with lead glazing of ornamental design. The inside woodwork is of pitch-pine left unvarnished. The contractors were Messrs. Moore Brothers, of Rawtenstall. Mr. R. Knill Freeman, F.R.I.B.A., of Bolton and Manchester, was the architect.

A New Catholic Church at Lisnaskea, Co. Fermanagh, is in course of erection. It will be built of local stone, and have cut stone dressings throughout, is in the Gothic style, and capable of seating 900 persons. It consists of a nave, transepts and chancel. The side chapels are separated from the chancel by arcades on clustered shafts of polished granites. The chancel has an octagonal end and large traceried windows. The tower and spire will be 150ft. high. The nave is 100ft. by 36ft., the chancel 26ft. 9in. long. The transepts are each 21ft. 6in. long and 18ft. in depth; the side chapels are each 10ft. by 9ft. 6in., and the tower is 10ft. square in the interior. The architect is Mr. Thomas F. McNamara, of Dublin; and Mr. James Wynne, of Dundalk, is the contractor.

The Erection of a Large Rowton House is to be commenced immediately in Birmingham. It is to occupy a site at the corner of Alcester and Moseley Streets of 4,000sq. yds. and will overlook Highgate Park. Its accommodation is to include a dining-room 100ft. by 60ft., and reading-, writing- and smoking-rooms. A disused malt house and a number of other old buildings are to be pulled down to make room, and it is expected that building operations will be well advanced before the summer is over. Mr. H. B. Measures, of Westminster, who is responsible for all the Rowton Houses in London, is the architect. Mr. Measures agrees with Lord Rowton as to the exceptional eligibility of the site, and goes so far as to state that if similar sites were available in London those who are interested in the housing of the poor would erect ten houses in the metropolis to-morrow. The Birmingham experiment will be made in the midst of a large industrial district, and within easy reach of the centre of the city by tram, and the building is to have several structural advantages over existing Rowton Houses.

The Royal Caledonian Asylum New Premises at Bushey, Herts, are being erected at a cost of £40,000, and when completed will accommodate 140 children. The asylum stands in ten acres of ground.

The Great West Window of the Nave of Hereford Cathedral has been erected by the women of the diocese in memory of Queen Victoria. The window is of seven lights and is of fourteenth-century character, the stonework being from a design by Mr. J. Oldrid Scott. The stained glass has been carried out by Messrs. Clayton & Bell.

A New Town Hall for Scarborough.—The Local Government Board have authorised the borrowing of sums of £10,485 and £6,590 for the adaptation of St. Nicholas House for the purposes of a town hall and public offices. The building is situated at the end of St. Nicholas Street, and commands the beautiful grounds recently laid open to the public known as St. Nicholas Gardens.

Hawley Hill House, Hawley, Hants, a large mansion belonging to Sir Richard Harrison, Inspector-General of Fortifications, was completely burned out last week. The house was in the workmen's hands. The fire broke out in the upper room of the west wing during the dinner hour when the men were away, and it quickly spread to other parts of the building. Most of the furniture and other contents were saved.

A New Girls' Club.—The Red House founded by the Rev. Harry Wilson in his East London parish of St. Augustine's, Stepney, is well-known. That institution is intended for men. Mr. Wilson now contemplates the building of a Blue House for young women and girls, and makes an appeal for £7,500 to enable him to carry out the work. The site is in the Commercial Road, adjacent to the church. The new premises will contain a large gymnasium and six clubs of two rooms each.

Derwentwater Protection.—The National Trust has completed the purchase of the Brandelhow Park, on the western shores of Lake Derwentwater, and 108 acres of picture-quely-situated wood and pasture land thus pass into the possession of the public in perpetuity. The scheme for the acquisition of the property in order to save it from possible development for building purposes was launched by the Trust last summer. Six months were given in which to obtain the purchase money of £7,000, and so cordially was the matter taken up by London newspapers and in the North of England that the whole amount was raised in just under five months.

New Barracks have been built for the Army Service Corps at Millbank. The main buildings consist of married and single quarters; the first facing the Thames and the latter running at right angles to it, both forming two sides of a parade ground. Together with the canteen, grocer's shop and guard-house, the buildings occupy about four acres. The married quarters consist of two-, three- and four-roomed suites, with scullery, &c. There is accommodation for thirty-four married non-coms, and men, and the single men's barracks will furnish room for eighty-four men. Beneath this block there is stabling for thirty-six horses, provision for stores, forage, harness-rooms, vans, &c. Every room is fitted up with electric light.

The Building Trade at Cape Town.—A deputation from the Master-Builders' Association of Cape Town recently waited upon the Colonial Secretary (the Hon. Arthur Douglass) for the purpose of voicing the views of the master-builders on the present restrictions, imposed under martial law, on the immigration of artisans into South Africa. The deputation included Mr. A. B. Reid (president), and Mr. W. F. Colman (secretary to the Association). Mr. Reid pointed out that the master-builders were encountering serious difficulties in obtaining labour at the present time, owing to the fact that such large numbers of artisans were leaving for the Rand, and they found that there were no fresh artisans leaving home to take the place of those that had gone up-country. All emigrants had to show before they left home that they either possessed the sum of £100 or were going out to a situation which would support them and their families. The result of that regulation was to

prevent artisans going out there at all, and the deputation desired to know whether it was possible to do anything in the direction of removing or alleviating the restrictions. The restrictions had been advertised all over Great Britain, and were so severe that they absolutely debarred the right class of men going out. Mr. Mitchell said he did not suppose there was a builder in Cape Town just now who was not in want of men. If the present rate of departure continued for another month they would hardly have a man left. Mr. Reid said the Master-Builders' Association would, if necessary, be prepared to guarantee that they would find employment for several hundred men. There was scope for the employment of 250 carpenters, 250 bricklayers, fifty masons, twenty-five plasterers and fifty painters. Mr. Douglass said he would see what could be done.

Trade and Craft.

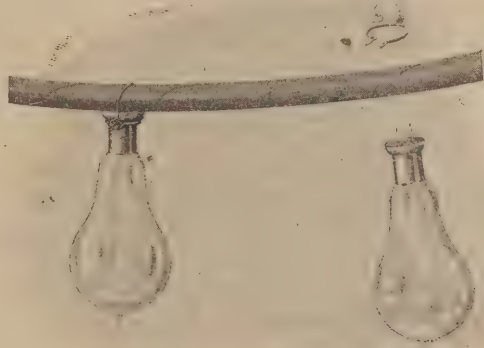
Electric Illumination.

One of the most interesting of recent developments in electric lighting has been the system introduced by the Electric Lighting Boards, Ltd., now made familiar by the very extensive and important purposes for which it has been adopted. The expense and trouble entailed in providing large numbers of fittings on an electrical system has hitherto been very great, and it is one of the chief features of the E.L.B. system that the lamps need no costly holders; moreover, their position can be quickly altered, which is of great advantage in many cases. Briefly, the system consists in employing specially-prepared boards or strips in which the lamps are stuck where desired, the lamps being provided with metal prongs which come into contact with the wires embedded in the material: so that no matter where the lamp is placed the moment it is pressed into position it lights up, and remains so. The advantages of such a system can be readily understood. The boards and strips are thoroughly fireproof, and their electrical resistance being very high, it is impossible to form what is known as a "short-circuit": in addition, if they are needed for outside positions they can be rendered entirely waterproof. Another fact worth mentioning is that the arc which is caused through breaking an electrical circuit at any point, such as when one lamp is substituted for another, is broken through asbestos, thus preventing any internal combustion, which has many times been the cause of serious fires. The uses to which the system is applicable are very numerous. It is particularly suitable for shop windows, show-rooms, offices or factories where the lights need to be quickly altered; while for theatres, music-halls and advertising purposes it is being very extensively employed. The system is also adapted to domestic lighting, as the lamps can be arranged in dado-mouldings or cornices (where lengths of the prepared strips are let in), around pictures, or for table-decoration. For temporary lighting—exhibitions, tents, street-decoration, &c—it is found to be particularly economical, as the great cost of wiring and fittings is avoided, all that is required being to arrange the prepared strips and boards in the manner desired and to stick the lamps in position: this is clearly shown by the accompanying illustration of a piece of out-door flexible strip with lamp clips. Of the many important schemes of illumination carried out on the E.L.B. system may be mentioned those on the occasion of the Tsar's recent visit to France, when 12,000 lamps in illumination devices, 500 garlands of lights, and 3,000 yds. of illumi-

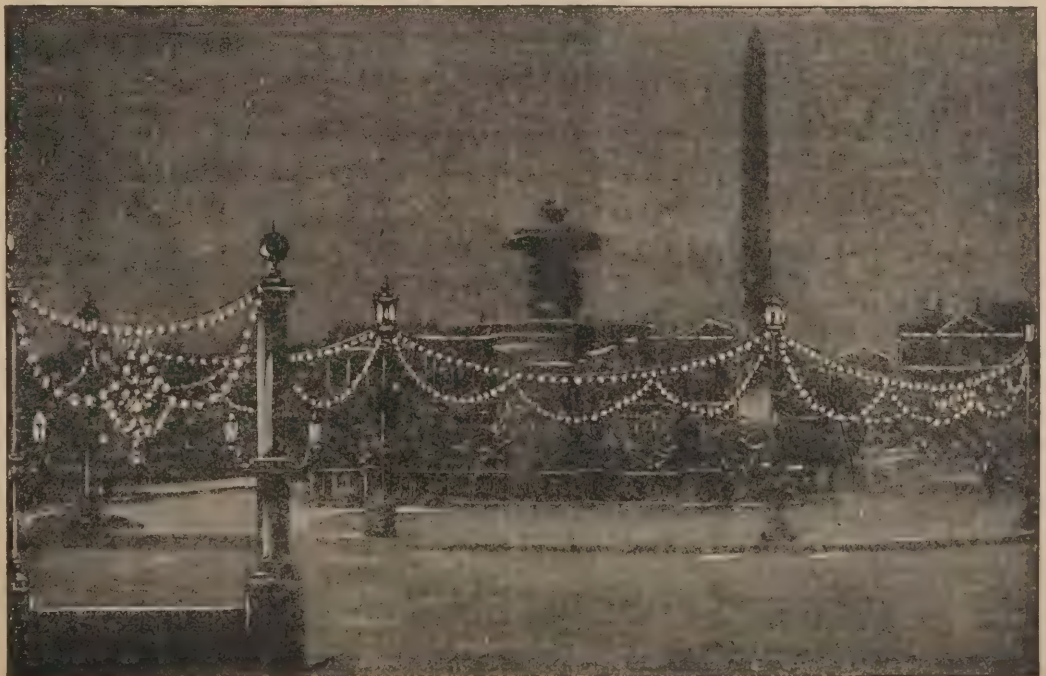
nated festoons were employed at Compiègne, in addition to which the whole of the official electric illumination on the Prefecture buildings and Town Hall at Dunkirk, of the Transatlantic liner *La Gascogne*, and of a French cruiser, were carried out on the same system. [The sale-room of the company is at 80, York Road, King's Cross, N., and the secretary's offices at 7, Pall Mall, S.W.]

A New Casement.

Mr. George Wragge, of Manchester, one of the foremost among those who have adapted the "Arts and Crafts" movement to commercial requirements, has lately introduced a new casement called the "Wardry." It retains that flat appearance on the outside which was a feature of the iron casements used in the old houses of the Renaissance period, and at the same time it is guaranteed water-tight, even when placed in the most exposed positions. It is side-hung to open outwards and is prepared for lead glazing, but the sections made are also suitable for double folding casements without a fixed centre rail, and for transome lights hung at the head to push out. Though the casement has only been perfected a few months, a number of architects have used it extensively, and during the winter it has been fixed at Earl Lytton's house, Knebworth, Herts; the Right Hon. Gerald Balfour's house, Fisher's Hill, Woking; and the St. Peter's Home, Woolverston Park, Ipswich; where it has



been thoroughly tested. Its neat appearance and moderate price should assure for it a large demand. Mr. Wragge's works are at 156 and 165, Chapel Street, Salford, where many kinds of handicrafts are carried on, it being the special aim in the leadwork to follow in the steps of those workers of the past who gave to the material that feeling of free fancy and charm which is so sadly lacking in modern work.



New Companies.

Gosforth Brick and Sanit Co., Ltd.

Registered to adopt a certain agreement for the acquisition of certain mining property in Gosforth, Northumberland; to deal in and with minerals of every description, stone, brick, earth, sand, silica; as brick, tile and terra-cotta manufacturers. Capital £1,000 in £10 shares. Registered office: Atlas Chambers, Westgate Road, Newcastle-on-Tyne.

Hampton Land and Building Co., Ltd.

Registered to acquire and turn to account in Middlesex, particularly at Hampton, and to deal in and with land, houses and other property of all kinds; as builders, decorators and contractors, merchants, dealers in stone, sand, lime, bricks and other building materials. Capital £20,000 in £10 shares. Registered office: Eastgate House, Eastgate Street, Gloucester.

Birchington Bay Property Co., Ltd.

Registered to acquire any houses, buildings, lands, and in particular a piece of land in the parish of Birchington, Thanet, Kent; to develop the same and to lay-out gardens, walks and promenades; to erect piers, shelters, seats and conveniences of all kinds; as builders and contractors, dealers in glass, bricks, lime, cement, stone, sand, gravel, slates, wood, timber, ironmongery, &c. Capital £14,000 in £1 shares. Directors: H. E. Trafford, W. S. Burt and H. K. Cone. Registered office: 380, Old Street, E.C.

London Stone Co., Ltd.

Registered to acquire the business of the London Steam Stone Sawmills, incorporated in 1884, and to carry on the general business of sawing, moulding, turning, or otherwise working York, Portland or other stone, marble or other mineral products for building purposes, chimney-pieces, lavatories, fountains, &c.; as paviors, artificial-stone makers, brick, tile and terra-cotta manufacturers, dealers in sand, lime, cement, timber; and builders and contractors. Capital £25,000 in £1 shares.

Rhymney Valley Land and Building Co., Ltd.

Registered to take a lease of land, part of the Hanbury estate at Bargoed, and of land part of the estate at Brithdir, to erect dwelling-houses and other buildings, and to carry on the business of land and property owners and agents, surveyors, auctioneers, builders, contractors, &c. Capital £5,000 in £10 shares. The first directors are W. F. P. de Winton, L. Davies, D. Harris and W. A. Richards. Registered office: Ffrwd offices, Mountain Ash.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
May 22	London—Renewing Hospital Floor	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 22	Leeds—Baths and Library	Corporation	H. A. Chapman, Architect, Prudential Buildings, Park Row, Leeds.
" 22	Portmadoc, Wales—Alterations, &c., to Market Hall ..	Ynysyngaiarn Urban District Council ..	M. Thomas, Surveyor, Council Office, Portmadoc.
" 22	Whitby, Yorks—Dwelling Fog-Signal House, &c. ..	Trinity House	Corderoy, Selby & Corderoy, 21 Queen Anne's Gate, Westminster.
" 22	Charmminster—House for Private Patients at Asylum ..	.. .. .	G. T. Hine, 35 Parliament Street, S.W.
" 22	Waltham, Fulborough—Memorial Hall .. .. .	.. .. .	W. Buck, Architect, Horsham.
" 22	Aberdare—House	Owmaman Coal Co., Ltd.	J. L. Smith & Davies, Architects, Aberdare.
" 22	Bargoed, Wales—Business Premises .. .. .	.. .. .	P. V. Jones, Architect, Hengoed.
" 22	Birstall, Yorks—Hospital	Joint Hospital Board	J. W. Burrows, Architect, Birstall.
" 22	Carnforth—House	Dr. Jackson	J. Pattinson, Architect, Windermere.
" 22	Crook, Durham—Church Institute and School .. .. .	.. .. .	Rev. J. King, Rector, Crook.
" 22	Derby—Lodge at Recreation Ground	Corporation	J. Ward, Borough Surveyor, Babington Lane, Derby.
" 22	Gloucester—Market Roof Works	Corporation	R. Read, City Surveyor, Guildhall, Gloucester.
" 22	Londonderry—House	R. N. Anderson	J. M. Robinson, 7 East Wall, Londonderry.
" 22	Rochdale—Boundary, &c., Walls	Corporation	S. S. Platt, Borough Surveyor, Town Hall, Rochdale.
" 22	Saltaire, Yorks—Workshop, &c.	Riddough & Hey	W. R. Nunns, Architect, Market Street, Bingley.
" 22	Warrington—Rebuilding Wall	Street Improvement Committee	Borough Surveyor, Town Hall, Warrington.
" 22	Cheshunt—Mortuary and Ambulance Shed	Urban District Council	Surveyor to Council, The Manor House, Turner's Hill, Cheshunt.
" 23	Brentwood—Retort House, Coal Store, Boiler House ..	Gas, Coke and Light Co., Ltd.	R. M. Couper, 3 Queen's Road, Brentwood.
" 23	Bristol—Store-rooms at Workhouse	Guardians	J. Simpson, Clerk, St. Peter's Hospital, Bristol.
" 23	Lowestoft—Schools	School Board	R. Beattie-Nicholson, 115 High Street, Lowestoft.
" 23	Aber, near Caerphilly—Vestry, Classrooms, &c. ..	.. .. .	G. A. Lundie, 53 Queen Street, Cardiff.
" 23	Bridlington—Alterations at Workhouse	Guardians	O. Gray, 26 High Street, Bridlington.
" 23	Grange-over-Sands—Schools, Lecture Hall, &c. ..	.. .. .	S. Shaw, Architect, Kendal.
" 23	Kendal—Six Houses and Out-offices	J. Richmond	S. Shaw, Architect, Kendal.
" 23	Tobercurry, Ireland—Footbridge	Sligo County Council	Secretary, Court House, Sligo.
" 24	Halifax—Rebuilding Lodge, &c.	Improvement Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 24	Bargoed, Wales—Altering, &c., Hotel .. .. .	.. .. .	A. O. Evans, Architect, Pontypridd.
" 24	Ynysyhir—133 Cottages	W. J. Thomas	E. Williams, Andrews Buildings, Queen Street, Cardiff.
" 24	Leiston, Suffolk—Alterations, &c., to Premises ..	Industrial Co-operative Society, Ltd. ..	H. J. Wright, 4 Museum Street, Ipswich.
" 26	Ilkeston—Car Sheds, Offices and Transformer Station ..	Tramways and Electricity Committee ..	Borough Surveyor, Town Hall, Ilkeston.
" 26	Beckenham—Foundations to Alternator, Disinfecting Chamber, &c. ..	Urban District Council	J. A. Angell, Surveyor, Council Offices, Beckenham.
" 26	Walthamstow—Classrooms, &c.	School Board	H. Prosser, Architect, School Board Offices, High St., Walthamstow.
" 26	Axbridge, Somerset—Infirmary	Board of Guardians	A. Powell, 3 Unity Street, College Green, Bristol.
" 26	Higham—Classrooms and Cloakrooms	Walthamstow School Board	H. Prosser, Architect, Sch. Bd. Offices, High Street, Walthamstow.
" 26	Cannock—Alterations, &c., to Schools	School Board	Bailey & McConna, Architects, Bridge Street, Walsall.
" 26	Ashton-under-Lyne—Hospital and Administrative Block, &c. ..	Guardians	J. Eaton, Sons & Cantrell, Stamford Street, Ashton-under-Lyne.
" 26	London, S.E.—Covered Play-Shed, Tar Paving, &c. ..	Metropolitan Asylums Board	T. D. Mann, Board's Offices, Embankment, E.C.
" 27	Manchester—Electric Car Shed and Offices	Corporation	J. M. McElroy, 55 Piccadilly, Manchester.
" 27	Winchester—Conveniences	Corporation	City Surveyor, Guildhall, Winchester.
" 27	Old Trafford, Manchester—Public Baths	Stretford Urban District Council	E. Woodhouse, 88 Mosley Street, Manchester.
" 27	Cwmystwyth, Wales—School Buildings	Llanfihangel-y-Croeddin Upper (U.D.) School Board	J. A. Jones, 7 Queen's Terrace, Aberystwyth.
" 27	Dukinfield—Police Station, &c. .. .. .	.. .. .	H. Beswick, County Architect, Newgate Street, Chester.
" 27	Plymouth—School Buildings	School Board	H. J. Snell, 11 The Crescent, Plymouth.
" 27	Ton Pentre, Wales—Bakery	Industrial Co-operative Society, Ltd. ..	W. D. Morgan, Architect, Victoria Chambers, Pentre, Glam.
" 27	Leeds—Bricks, &c.	Gas Department	R. H. Townsley, General Manager, Gas Offices, Leeds.
" 27	Govan, Scotland—Bricks, &c.	Town Council	J. Brown, Resident Electrical Engineer, Electricity Works, Govan.
" 27	Stratford-on-Avon—Laundry and Boiler House	Union Guardians	C. Smith & Son, 164 Friar Street, Reading.
" 28	Llantrisant—Isolation Hospital	Rural District Council	G. S. Morgan, Surveyor, School Street, Pontyclun.
" 28	Thorpe, co. Durham—Additions to Hospital	Easington Rural District Council	Farthing & Dunn, 21 Pilgrim Street, Newcastle-on-Tyne.
" 28	Barton, Somerset—Laboratory and Classrooms	Governors of King's School	A. J. Pictor, Architect, Barton, Somerset.
" 28	Andsell, near Lytham, Lancs—Passenger Station, &c. ..	Lancs & Yorks & L.N.W. Ryds.	Engineer, L. & Y. Ry., Hunt's Bank, Manchester.
" 28	Cumstock, Staffs—Reconstructing Bridge	Rural District Council	H. M. Whitehead, Surveyor to Council, Penkridge, Stafford.
" 28	Coventry—Police Station, Free Library & Fire Station ..	Corporation	J. E. Swindhurst, City Engineer, St. Mary's Hall, Coventry.
" 28	Halifax—Three Houses .. .. .	.. .. .	H. G. Dalzell, 15 Commercial Street, Halifax.
" 28	Manchester—Brick Viaduct	Electricity Committee	City Surveyor, Town Hall, Manchester.
" 28	Tanfield, Durham—Re-erection of Bridge	Urban District Council	R. Heslop, Surveyor, Burnopfield.
" 28	Ramsgate—Portland Cement	Corporation	Borough Surveyor, Abdon House, Ramsgate.
" 29	Wardhouse, Aberdeen—Alterations on Steading ..	.. .. .	A. Taylor, Overseer, Wardhouse.
" 29	Halifax—Implement Works	Rural District Council	L. Coates, Architect, Yorkshire Bank Chbrs., Waterhouse St., Halifax.
" 29	Belper—Reconstructing Culvert	Saxon Building Club	R. C. Cordon, Engineer, Hazelwood, Derby.
" 29	Merthyr, Wales—Fifty-three Cottages	Corporation	P. V. Jones, Architect, Hengoed.
" 29	West Hartlepool—Hospital Building	East Barnet Valley Urban District Council ..	Borough Engineer, West Hartlepool.
" 29	New Barnet—Fire Engine Station and Steam-Roller House, &c. ..	.. .. .	H. York, Surveyor, Council Offices, Station Road, New Barnet.
ENGINEERING:			
May 22	Nelson—Reservoir	Corporation	Water Manager, Town Hall, Nelson.
" 22	Aberdare—Vertical Boiler	Urban District Council	Surveyor, Town Hall, Aberdare.
" 22	London, N.E.—Steam Roller	Hackney Borough Council	Surveyor, Town Hall, Hackney, N.E.
" 22	Portb, Wales—Exhauster	Rhondda Urban District Council	O. Thomas, Manager, Gas and Water Offices, Pentre, R.S.O.
" 22	Rochdale—Two Bridges	Corporation	S. S. Platt, Borough Surveyor, Town Hall, Rochdale.
" 22	Trench, near Wellington, Salop—Plant	Gas Company	A. W. Walker, Mgr., Gas Works, Trench Sidings, near Wellington.
" 22	Pentre, Glamorgan—Bridge, &c.	Rhondda Urban District Council	W. J. Jones, Engineer, Council Offices, Pentre.
" 22	Neath—Arching, &c., Colliery Shaft .. .. .	.. .. .	Manager, Seven sisters Colliery, near Neath.
" 23	Stirling—Waterworks	Eastern District Committee	Warren & Stuart, 94 H. ps Street, Glasgow.
" 23	Brighouse—Water Cistern and Boiler	Gas Committee	J. Parkinson, Town Clerk, Municipal Offices, Brighouse.
" 23	Southwold, Suffolk—Repairing, &c., Pier	Corporation	Borough Surveyor, Town Hall, Southwold.
" 24	Delper—Sewers	Rural District Council	R. C. Cordon, Engineer, Hazelwood, near Derby.
" 24	Leeds—Cast-iron Water Cistern at Gasworks	Corporation	R. H. Townsley, General Manager, Gas Offices, Leeds.
" 24	Milford, Ireland—Water and Sewerage Works	Rural District Council	J. M. Robinson, 7 East Wall, Londonderry.
" 24	Sudbury, Suffolk—Refuse Destructor	Drainage Committee	T. W. A. Hayward, Borough Engineer, Town Hall, Sudbury.
" 24	Knaresborough—Re-setting-Retorts	Urban District Council	T. Mainman, Clerk, Council Offices, Knaresborough.
" 26	Worthing—Dynamo, Boiler, &c.	Corporation	Burshall & Markhouse, 14 Old Queen Street, Westminster, S.W.
" 26	Coventry—Steam and Water Pipes, &c.	Electric Light Committee	Electrical Engineer, Electricity Works, Coventry.
" 26	Linlithgow—Waterworks	District Committee	W. A. Tait, 72a George Street, Edinburgh.
" 27	Manchester—Motor Wagon	Cleansing Committee	G. Plant, Supd., Cleansing Department, Town Hall, Manchester.
" 27	Rhyl—Condensers, &c.	Urban District Council	L. G. Hall, Gas Engineer, Olwyd Street, Rhyl.
" 27	Leamington—Motor Fire Tender, Escape, &c. ..	Corporation	Chief Constable, Police Station, Leamington.
" 27	London, S.E.—Two Road Rollers	Deptford Borough Council	V. Orchard, 20 Tanner's Hill, Deptford.
" 27	Old Trafford, Manchester—General Engineering, Boilers, &c., at Baths ..	Stretford Urban District Council	E. Woodhouse, 88 Mosley Street, Manchester.
" 27	London, N.W.—Hot-water Supply, Heating and Laundry Apparatus ..	Willesden District Council	O. C. Robson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
" 28	Aussell, near Lytham—Roads, Bridge, Station, Warehouse, &c. ..	Lancs & Yorks & N.W. Railways	Engineer's Office, L. & Y. Railway, Hunt's Bank, Manchester.
" 28	Manchester—Steel Bridge	Electricity Committee	City Surveyor, Town Hall, Manchester.
" 31	Thorney, Peterborough—Gas Mains	Gas Company	A. J. Forrest, Bedford Office, Thorney, Peterborough.
" 31	Wingate, Durham—Reservoir, &c.	Water Co., Ltd.	T. Bower, Engineer, Ribbles House, West Hartlepool.
" 31	Southampton—Dredging	Harbour Board	W. Bowyer, Clerk, Town Quay, Southampton.
" 31	Bridgend, Glamorgan—Electric Wiring and Fittings ..	Committee of County Asylums	W. E. R. Allen, Clerk, Glamorgan County Offices, Cardiff.
" 31	Littlehampton—Water-Mains	Urban District Council	H. Howard, Surveyor, Town Offices, Littlehampton.
FURNITURE:			
May 26	Newcastle-on-Tyne—Furnishing, &c., to Hospital ..	.. .. .	Health Department, Town Hall, Newcastle.
" 28	Hastings—Furniture for Workhouse	Guardians	A. R. Inskipp, 11 Wellington Square, Hastings.
IRON AND STEEL:			
May 22	Ilfracombe—Water Mains	Urban District Council	Council's Engineer, Town Hall, Ilfracombe.
" 24	Bury, Lancs—Pipes	Water Board	J. Cartwright, Peel Chambers, Market Place, Bury.
" 24	Manchester—Cast-iron Bases, &c., to Tramway Poles ..	Tramways Committee	J. M. McElroy, 55 Piccadilly, Manchester.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
IRON AND STEEL—cont.:			
May 24	Levenshulme, Lancs.—Manhole Covers, &c.	Urban District Council	J. Jepson, 8A Tiviot Dale, Stockport.
" 24	Newcastle-on-Tyne—Wrought-iron and Steel, &c.	Tyne Improvement Commissioners	Commissioners' Engineer, Bewick Street, Newcastle-on-Tyne.
" 26	London, E.C.—Iron and Steel, Bolts, Nuts, Nails, &c.	Conservators of River Thames Corporation	R. Philip on, Sec., Conservators' Offices, Victoria Embankment, E.O.
" 26	Darwen, Lancs.—W.I. Tubes & Fitting, C.I. Main, &c.	Distric Committee	A. A. Smith, Gas Engineer, Darwen.
" 26	Linthgow—Cast-iron Pipes	Corporation	W. A. Tait, 73A George Street, Edinburgh.
" 26	Richmond, Surrey—Cast-iron Mains	Southern Mahratta Rly. Co., Ltd.	W. G. Peirce, Engineer, Waterworks, Richmond.
" 27	London, F.C.—Wheels and Axles	Hornsey Urban District Council	E. Z. Thornton, 46 Queen Anne's Gate, Westminster.
" 27	London, N.—Fire Hydrants and Covers	Gas Department	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
" 27	Leeds—Wrought-iron Tubes	Bengal-Magpur Rly. Co., Ltd.	R. H. Townsley, General Manager, Gas Offices, Leeds.
" 27	London, E.C.—Railway Stores	Urban District Council	Company's Offices, 132 Gresham House, Old Broad Street, E.C.
" 27	Dartford—Hardware, &c.	Town Council	W. Harston, 8 Hythe Street, Dartford.
" 27	Govan, Scotland—Electrical Stores	Corporation	J. Brown, Resident Electrical Engineer, Electricity Works, Govan.
" 30	Hull—Cast-iron Holding-down Plates	Cambrian Railway Co.	A. E. White, City Engineer, Town Hall, Hull.
" 31	Oswestry—Tubes and Fittings, &c.	Corporation	Stores Office, Cambrian Works, Oswestry.
" 31	Walsall—Tubes and Fittings, Iron, &c.	Town Council	Gas Office, Bridge Street, Walsall.
June 9	Brighton—Points, Crossings, &c.	Town Council	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.
" 9	Brighton—Tramrails	Town Council	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.
PAINTING AND PLUMBING:			
May 22	Liverpool—Painting outside of Workhouse	West Derby Union Guardians	H. P. Cleaver, Clerk, Brougham Terrace, West Derby Rd., Liverpool.
" 24	Newcastle-on-Tyne—Copper and Lead Goods	Tyne Improvement Commissioners	Commissioners' Engineer, Bewick Street, Newcastle-on-Tyne.
" 26	London, E.C.—Brushes, Paints and Varnishes	Conservators of the River Thames Corporation	R. Philipson, Secretary, Offices, Victoria Embankment, E.O.
" 26	Darwen, Lancs.—Paints and Oils, Lead Pipe	Corporation	A. A. Smith, Gas Engineer, Darwen.
" 26	Hove, Sussex—Colouring and Painting Town Hall	Corporation	Borough Surveyor, Town Hall, Hove.
" 31	Oswestry—Oils, Lead, Paints, Varnishes	Cambrian Railway Co.	Stores Office, Cambrian Works, Oswestry.
" 31	Walsall—Lead Piping, Brushes, &c.	Corporation	Gas Office, Bridge Street, Walsall.
ROADS AND CARTAGE:			
May 22	Hoyland, near Barnsley—Street Improvements, &c.	Urban District Council	W. P. Young, Surveyor, Town Hall, Hoyland, near Barnsley.
" 22	Sudbury, Suffolk—Granite	Melford Rural District Council	W. Carver, Surveyor, Oronwell Villas, Suffolk Road, Sudbury.
" 22	Friern Barnet—Hardcore, Hoggins, Granite, Gravel and Cartage.	Urban District Council	E. J. Reynolds, Surveyor, Beaconsfield Road, Friern Barnet, N
" 22	Pentre, Glamorgan—Widening Road, Footways, &c.	Rhondda Urban District Council	W. J. Jones, Engineer, Council Offices, Pentre.
" 22	Reading—Street Improvement Works	Sanitary Authority	J. Bowen, Borough Surveyor, Town Hall, Reading.
" 22	Southend-on-Sea—Street Works	Corporation	A. Fidler, Borough Surveyor, Southenl-on-Sea.
" 23	Brighton—Granite Kerb and Channel	Corporation	F. J. O. May, Borough Surveyor, Town Hall, Brighton.
" 24	Burnley—Paving, &c.	Corporation	Borough Surveyor, Town Hall, Burnley.
" 24	Southwick, Sussex—Flints	Urban District Council	G. W. Warr, Surveyor, Council Offices, Southwick.
" 24	Ynysyhir, Wales—Roads	W. J. Thomas	E. Williams, Andrews Buildings, Queen Street, Cardiff.
" 24	Levenshulme, Lancs.—Setts, Flags, Limestone Chip-pings, &c.	Urban District Council	J. Jepson, 8A Tiviot Dale, Stockport.
" 26	London, E.—Tar-paving Playgrounds	East Ham School Board	R. L. Curtis, 120 London Wall, Moorgate Street, E.O.
" 26	Stratford-upon-Avon—Road Store	Town Council	R. Dixon, Borough Surveyor, Municipal Offices, Stratford-on-Avon.
" 26	East Ham—Tar Paving	School Board	R. L. Curtis, 120 London Wall, Moorgate Street, E.O.
" 26	Guildford—Road Works	Rural District Council	J. Anstee, Surveyor, Commercial Road, Guildford.
" 26	Romford—Granite, &c.	Urban District Council	C. T. King, Clerk, Council Offices, Romford.
" 26	Rugeley, Staffs—Granite Macadam	Urban District Council	W. E. Rogers, Council's Surveyor, Rugeley.
" 27	Dartford—Stores and Materials	Urban District Council	W. Harston, 8 Hythe Street, Dartford.
" 27	Leeds—Flags, Lime, &c.	Gas Department	R. H. Townsley, General Manager, Gas Offices, Leeds.
" 27	Sale—Limestone Asphalt	Urban District Council	W. Holt, Surveyor, Council Offices, Sale.
" 28	Litherland—Road and Street Works	Urban District Council	A. H. Carter, 25 Sefton Road, Litherland.
" 31	Shotton Colliery—Street-Formation	Urban District Council	Shotton Colliery Office.
" 31	Little Woolson, Liverpool—Macadam	Urban District Council	R. Simmons, Surveyor, Grange Lane, Garscarr, near Liverpool.
June 4	Andover—Materials	Rural District Council	J. Wormald, District Surveyor, Andover.
" 14	Uckfield, Sussex—Hire of Road Rollers	Rural District Council	F. Holman, Clerk, High Street, Lewes.
SANITARY:			
May 22	Birkenhead—Lime	Corporation	T. O. Patterson, Gas Engineer, Town Hall, Birkenhead.
" 24	Levenshulme, Lancs.—Sewer and Drain Pipes, Traps, Disinfectants, &c.	Urban District Council	J. Jepson, 2A Tiviot Dale, Stockport.
" 26	Ashton-under-Lyne—Drainage Works	Guardians	J. Eaton, Sons, & Cantrell, Stamford Street, Ashton-under-Lyne.
" 26	Farnon, Beds—Sewer	Luton Rural District Council	B. B. Franklin, 21 Market Hill, Luton.
" 26	London, N.—Sewers, &c.	Hornsey Urban District Council	E. J. Lovegrove, Council's Surveyor, Southwood Lane, Highgate, N.
" 26	Otley, Yorks—Sewerage and Sewage-Disposal Works.	Urban District Council	J. E. Sharpe, Surveyor, Council Offices, Otley.
" 27	Dartford—Disinfectants, &c.	Urban District Council	W. Harston, 8 Hythe Street, Dartford.
" 27	Bristol—Drainage and Sewer Works	Sanitary and Improvement Committee	T. H. Yabbicom, 63 Queen Square, Bristol.
" 27	Burton-on-Trent—Lime	Gas and Electric Light Committee	F. L. Ramsden, Mng'r., Gas & Electric Light Wks., Burton-on-Trent
" 27	New Mill, near Huddersfield—Sewerage and Sewage-disposal Works.	Urban District Council	O. H. Marriott, Son & Shaw, Engineers, Council Offices, New Mill, near Huddersfield.
" 27	Plymouth—Sewerage Works	Corporation	J. Mansergh & Sons, 5 Victoria Street, Westminster.
" 28	Andershaw, Lancs—Sewers	Urban District Council	J. P. Wilkinson, 47 Arcade Chambers, St. Mary's Gate, Manchester.
" 28	Kingsbury, Tamworth—Sewerage Works	Rural District Council	H. J. Olarson, 22 Church Street, Tamworth.
" 28	Lichfield, Staffs—Sewerage Works	Rural District Council	W. E. Rogers, Surveyor, Rugeley.
" 30	Sudbury, Suffolk—Sewerage Works	Drainage Committee	T. W. A. Hayward, Borough Surveyor, Town Hall, Sudbury.
" 31	Oswestry—Drain Pipes, Lime, &c.	Cambrian Railways Co.	Stores Office, Cambrian Works, Oswestry.
June 3	Barking, Essex—Drainage Works	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
" 4	Parton-under-Needwood—Sewerage Works	Sudbury Rural District Council	Wilcox & Raikes, 63 Temple Row, Birmingham.
" 4	Hove, Sussex, Sewer Work	Corporation	Borough Surveyor, Town Hall, Hove.
" 10	Bridgwater, Somerset—Sewer	Town Council	Borough Surveyor, Municipal Buildings, Bridgwater.
TIMBER:			
May 24	Newcastle-on-Tyne—Timber, &c.	Tyne Improvement Commissioners	Commissioners' Engineer, Bewick Street, Newcastle-on-Tyne.
" 26	Barnsley—Chopped Firewood	School Board	T. Baldwin, Clerk, Mark Street, Barnsley.
" 26	London, E.C.—Lumber	Conservators of River Thames	R. Philipson, Sec., Conservators' Offices, Victoria Embankment, E.O.
" 27	Govan, Scotland—Creosoted Wood	Town Council	J. Brown, Resident Electrical Engineer, Electricity Works, Govan.
" 31	Oswestry—English and Foreign Timber	Cambrian Railway Co.	Stores Office, Cambrian Works, Oswestry.
" 31	Walsall—Timber	Corporation	Gas Office, Bridge Street, Walsall.
June 9	London, W.C.—Firewood	London School Board	Contracts Sub-Depart., School Bd. Offices, Victoria Embankment, W.O.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May 31	Sedgefield—Infectious Diseases Hospital	£10.	W. Snowdon, Surveyor, Council Office, Sedgefield.
June 1	Knarsborough—Infectious Disease Hospital	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 12	Crewe—Municipal Office and Council-Chamber	£50, £25.	Borough Surveyor, Municipal Offices, Crewe.
" 16	Hartshill, Stoke-on-Trent Nurses Home	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 22	Rhymney—Oottage Hospital	—	B. Jones, 29 Plantation Street, Rhymney.
" 27	West Hartlepool—School	£75, £35.	J. R. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Unarch House, South John Street, Liverpool.
July 15	London, N.—Municipal Buildings	£200, £100, £50.	W. H. Prescott, Engineer, U.D.C. Offices, Tottenham.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
Sept. 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Rainer's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprava, St. Petersburg.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRIGHTON.—For the extension of the car sheds, the erection of boundary walls, and certain other works in connection therewith, at the Lewes Road Tramway Depot, for the Town Council:—
Sattin & Evershed, Brighton ... £5,480
W. A. Field & Co., Brighton ... 5,211
James Longley & Co., Crawley ... 5,519
* Accepted.

BLABY (LEICS.).—For the construction of sewerage and sewage disposal works for the parish of Blaby, for the Blaby Rural District Council. Mr. J. Turner, surveyor, Saffron Lane, Glen Parva, near Leicester:—
J. Chapman, Leicester ... £8,500
G. Brown & Sons, Leicester ... 6,300
Braithwaite & Co., Leeds ... 6,281
Halford & Sons, Blaby ... 6,177
C. Chamberlain, Leicester ... 6,172
J. Holmes, Leicester ... 5,906
R. W. Barker, Harrogate ... 5,907
A. Jewell, Market Harborough ... 5,900
W. Moss & Sons, Leicester ... 5,888
T. Philbrick, Leicester ... 5,799
Braith & Son, Leicester ... 5,785
H. Mason, Leicester ... 5,621
Cox & Son, Leicester ... 5,621
* Accepted.

BRISTOL.—For the erection of a cast-iron and steel water storage tank at Ham Green Hospital, Pill, Bristol, for the Health Committee. Mr. T. H. Yabbicom, M.I.C.E., city engineer:—
R. Dempster & Son, Eiland, Yorks ... £2,850 0
Westwood & Wrights, Brierley Hill ... 1,473 0
Manlove, Allott & Co., Nottingham ... 1,875 0
A. D. Dawney & Son, Cardiff ... 1,865 0
Stevenson & Co., London ... 1,900 0
Head, Wrightson & Co., Thornaby-on-Tees ... 1,481 15
H. Sampson & Sons, Redmire, Bristol ... 1,472 10
J. Lysaght, Ltd., Bristol ... 1,544 0
* Accepted.

CARDIFF.—For the construction of about 540 lineal yards of 3 feet 3 inches by 2 feet brick sewers, with junctions, manholes, side entrances, and appurtenant works in Fitzalan Place, West Grove, and Richmond Road, for the Corporation. Mr. William Harpur, M.I.C.E., borough engineer:—
J. Allen, Woodville Road ... £2,505 10 3
Barnes, Chaplin & Co., St. Peter Street ... 2,340 10 0
F. J. Robbins, 1 Cottrell Road ... 2,278 12 6
J. E. Evans, Inverness Place ... 2,185 0 0
J. Rees, Ty-y-n-coed, Llandaff, near Cardiff ... 1,948 2 6
F. Ashley, 25 Conway Road ... 1,797 2 0
C. Davies, 35 Court Road ... 1,495 10 0
* Recommended for acceptance. [Rest of Cardiff.]

COALVILLE (LEICS.).—For all trades required in erection and completion of proposed Primitive Methodist church and schools, Marlborough Square, Coalville. Messrs. McCarthy & Co., architects, Marlborough Square, Coalville. Quantities by architects:—
Watson & Camm, Loughborough ... £3,700
F. Elliott, Leicester ... 3,088
W. F. Harding, Loughborough ... 3,582
Moss & Sons, Loughborough ... 3,540
Herbert & Sons, Leicester ... 3,435
Riddett & Sons, Leicester ... 3,318
G. Beckwith, Whitwick ... 3,333
Moss & Sons, Ltd., Loughborough ... 3,300
W. Moss, Coalville ... 3,273
E. Orton, Coalville ... 3,209
C. Wright, Leicester ... 3,016
Stour Bros., Leicester ... 2,841
Griffin Bros., Hugglesworth, Leicester ... 2,875
* Accepted. [Architect's estimate, £28,500.]

CHESTERFIELD.—For the erection of New Stores at West Bars, Chesterfield, for the Chesterfield Co-operative Society. Messrs. George Haslam & Son, architects, Euclid House, Ilkeston:—
Jno. Wright, Chesterfield ... £2,045
J. H. Vickers, Ltd., Nottingham ... 2,020
G. A. Pilliat, Nottingham ... 2,070
F. Lee Alfreton ... 2,050
A. B. Clarke, Nottingham ... 2,050
Davison & Son, Dronfield ... 2,059
* Accepted.

ETWALL (DERBY).—For the erection of an isolation hospital at Etwall, for the Region Isolation Hospital Committee. Mr. Arthur Eaton, architect, 6 St. James Street, Derby:—
W. Wood, Hilton ... £7,005
W. Walkerdine ... 7,476
Brown & Son ... 7,400
E. Morley ... 7,270
Lowe & Sons, Burton-on-Trent ... 7,241
Vernon ... 7,222
R. Kershaw, Burton-on-Trent ... 7,175
J. & J. Warner, Mickleover ... 7,063
H. Vernon ... 7,017
Radford & Greaves ... 6,930
* Accepted. [Rest of Derby.]

FARNBOROUGH (KENT).—For rebuilding the Woodman Inn, including pulling down old building, &c., for Messrs. Fox & Sons, Messrs. Barrett & Driver, architects, 53 Blomfield Road, Maid Vale, W.:—
C. E. Bulley ... £1,020
W. Owen ... 1,500
Somerford & Son ... 1,510

Smith & Sons ... 1,428
Wallis & Sons, Maidstone ... 1,364
* Accepted.

FEATHERSTONE (YORKS.).—For sewerage works in the district, including sewer trenching, sanitary pipes, bricks, and labour, manholes, flushing chambers, &c., for the Urban District Council. Mr. Frederick B. Roders, C.S.I., engineer and surveyor:—
G. Clements, Featherstone ... £1,201 7 1
M. Dixon, Ackworth ... 1,345 0 0
M. Arundel ... 1,430 0 0
T. & G. Wilson, Park Lane, Wakefield ... 1,470 19 0
C. Harris, Denholme Sewerage Works ... 1,551 4 1
Eastwood & Co., Morley ... 1,631 0 3
* Accepted.

FARNBOROUGH (KENT).—For rebuilding "The Woodman" Inn, including pulling down the old building, for Messrs. Fox & Sons, Messrs. Barrett & Driver, Architects, 53 Blomfield Road, Maid Vale, W.:—
C. E. Bulley, Chis'ehurst ... £1,020
W. Owen, Farnborough ... 1,500
H. Somerford & Son, Orpington ... 1,510
W. Smith & Sons, Bromley Common ... 1,428
G. E. Wallis & Sons, Maidstone ... 1,301
* Accepted.

GLOUCESTER.—For the erection of an infants' school in Linden Road for the Gloucester School Board. Mr. H. Medland, F.R.I.B.A., architect, 15 Clarence Street, Gloucester:—

Fincher & Co., Stratford-on-Avon ... £5,725 0
W. T. Nicholls ... 5,440 0
A. King & Sons ... 5,388 0
T. Gurney ... 4,977 0
J. Baird & Son ... 4,830 0
Freeman & Jones ... 4,897 0
Bowers & Co., Hereford ... 4,707 15
Colborne, Swindon ... 4,736 17
W. Jones ... 4,710 0
Smith & Pitt, Birmingham ... 4,645 0
J. T. Williams ... 4,574 0
J. Gurney ... 4,297 5
Geary, Walter & Co., London ... 150 10 0
Bailys & Co. ... 180 2 8
Ebner & Co., London ... 207 14 0
W. Wilby ... 183 11 0
Homan & Co., Manchester ... 157 13 0
R. Lorne, Farnworth ... 165 0 0
W. Duffy, London ... 164 7 11
Ashby & Co. ... 164 7 11
* Accepted.

HARROW.—For the erection of two small detached houses in Pinner View, Harrow. Messrs. Clarke & Charles, architects, Harrow:—
M. Dymock ... £1,265
Lee & Co. ... 1,225
J. Rackham ... 1,140
Simmons, Willenden ... 1,135
* Accepted.

LEICESTER.—For the construction of foundations, abutments, wing walls, &c., for two bridges over streams crossing Coalpit Lane, Aylestone, and for other works in connection therewith, for the Highways and Sewerage Committee. Mr. E. G. Mawbey, M.I.C.E., borough engineer:—
Johnson & Langley ... £1,084 4 1
Moss & Sons ... 1,099 0 0
J. H. Smedley ... 1,125 0 0
J. E. Johnson & Son ... 1,100 0 0
Richardson & Son ... 1,233 0 0
H. Herbert & Sons ... 1,370 0 0
C. Chamberlain ... 1,067 10 0
T. Philbrick ... 1,045 0 0
T. Chapman ... 1,021 0 0
* Accepted. [All of Leicester.]

LONDON, S.E.—For the erection of a disinfecting chamber, stabling, &c., at the Council premises, Wanless Road, Loughborough Junction, for the Lambeth Borough Council. Mr. Henry Edwards, C.E., borough surveyor:—

	Disinfecting Chamber.	Stabling.
Foster Bros., Norwood Junction	£3,136	£924
J. Chessum & Sons	2,718	960
G. Parker	2,675	965
B. E. Nightingale	2,508	875
J. Smith & Son, South Norwood	2,535	804
Rice & Son	2,517	918
J. Parsons	2,500	887
T. G. Minter	2,487	900
J. O. Richardson	2,460	881
Edwards & Medway	2,450	805
L. Whitehead & Co.	2,450	870
W. H. Loden & Son, Upper Tooting	2,433	900
T. G. Sharphington, Nunhead	2,288	883
J. Hamm	2,102	855

Note.—The tender of Mr. T. G. Sharphington has been accepted for a portion of the work only at £1,116 14s. 2d.

LONDONDERRY.—For the execution of the following work, for the Proposal Committee of the County Council—viz., altering and repairing the structure of the County Court House, Londonderry, and to provide furniture for same. Mr. C. L. Boddie, A.M.I.C.E., county surveyor:—

Smyth Bros., Waterside ... £4,201
R. Colhoun, Strand ... 3,980
J. Ballintine, Strand ... 3,914
* Accepted.

LONDON, W.—For work at St. James's Hall, 21 and 23 Piccadilly. Mr. Walter Emden, architect, 105 and 106 Strand, W.C.:—
Bywater & Co. ... £18,102 11
Howard & Co. ... 18,000
Spencer Santo ... 14,935
Holliday & Greenwood ... 14,777
Patman & Fotheringham ... 14,740
Trollope & Co. ... 14,355
J. L. Beddall & Co. ... £14,370
Roffey ... 13,900
Lovatt & Co. ... 13,950
Carmichael ... 13,802
A. J. Bateman ... 11,614

NEWARK.—For the construction of sewerage and sewage disposal works for the parish of Balderton for the Newark Rural District Council. Messrs. Herbert Walker & Son, engineers, Albion Chambers, King Street, Nottingham:—
J. Cooper & Sons, Ltd., 44r Street, Nottingham ... £17,510 0
G. Brown & Son, Newark, Notts ... 13,000 0
J. F. Price, Ebury Road, Nottingham ... 13,070 0
Thompson & Wilkinson, Ongar ... 12,700 17
C. Baines, Newark, Notts ... 12,100 0
Cope & Raynor, Lenton, Nottingham ... 10,840 14
Bower Bros., West Bridgford, Nottingham ... 10,600 0
J. H. Vickers, Ltd., Nottingham ... 10,400 0
T. Barlow, Beauvale Road, Nottingham ... 9,930 0
A. Jenkins, Southwell, Notts ... 9,382 0
[Engineer's estimate, £10,084.]
* Accepted.

Wood Block Flooring.

School.	Redwood.	Maple.
£250 0 0	169 15 6	£315 0 0
170 0 0	170 0 0	220 11 0
167 0 0	157 13 0	264 0 0
150 15 0	150 15 0	195 10 0
203 0 0	160 0 0	205 0 0
140 0 0	140 0 0	296 0 0
150 10 0	150 10 0	210 10 0
180 2 8	180 2 8	370 19 6
207 14 0	183 11 0	244 13 0
157 13 0	157 13 0	204 10 6
165 0 0	165 0 0	203 0 0
164 7 11	164 7 11	196 12 11*

4s. 3d. per yd. [Rest of Gloucester.]

LOUGHBOROUGH (LEICS.).—For extensions and alterations to the Loughborough Police Court, for the Leicestershire County Council. Mr. S. Perkins Pick, F.R.I.B.A., county architect, Leicester:—

J. Dallow, Blackheath, Birmingham ... £5,410
T. Barker & Son ... 5,439 0
A. Faulks ... 5,000 0
H. Herbert & Sons, Leicester ... 4,880 0
W. F. Harding ... 4,882 10
Scurr-Jowett & Co., Barrow-on-Soar ... 4,613 0
W. Corah ... 4,590 0
W. Moss & Sons, Ltd. ... 4,590 0
[Rest of Loughborough.]

MARKET HARBOUROUGH.—For new cattle market buildings (Contract No. 8), for the Urban District Council. Mr. H. G. Coales, A.M.I.C.E., architect:—

G. Martin ... £5,780
E. Dexter ... 5,623
Goodman & Murkett, Wellingborough ... 5,597
E. Brown & Sons, Wellingborough ... 5,585
G. Henson, Wellingborough ... 5,585
W. W. Brown ... 5,537
Herbert & Sons, Leicester ... 5,407
J. Main ... 5,408
Hacksley Bros., Wellingborough ... 5,417
Richardson & Son, Leicester ... 5,419
J. Wingrove, Northampton ... 5,385
G. H. Eastwood ... 5,311
T. Hickman ... 5,225
Co-operative Builders, Kettering ... 5,107
C. Wright, Leicester ... 5,000
* Accepted.

[Architect's estimate, £5,107. Rest of Market Harborough.]

NORTHAMPTON.—For additions to the Northampton General Infirmary. Mr. F. W. Dorman, A.R.I.B.A., architect and surveyor, Northampton:—

A. P. Chown ... £34,550
Pullen & Sons ... 34,459
G. Henson, Wellingborough ... 33,475
J. Rowbotham, Birmingham ... 32,777
J. E. Johnson & Sons, Leicester ... 32,700
H. Branson ... 32,000
W. Higgins ... 31,300
Sharman & Sons ... 31,280
C. W. Souster ... 31,080
R. Cosford ... 30,980
J. T. Wingrove ... 30,700
H. Green ... 30,497
A. P. Hawtin ... 30,150
Brown & Sons, Wellingborough ... 30,100
E. Archer ... 29,278
H. Martin ... 28,010
* Accepted.

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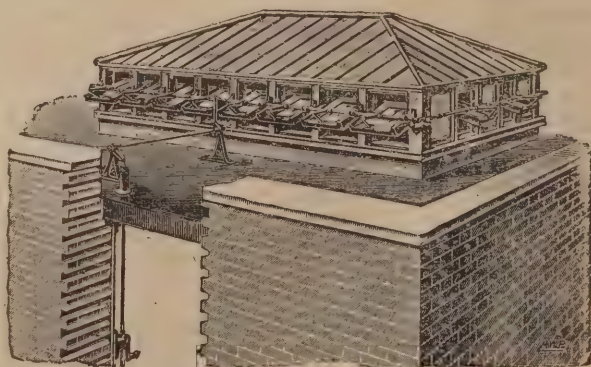
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PANIC-EGRESS BOLTS. Approval by the L.C.C.

NOTTINGHAM.—For piling on the south bank of the River Trent, for the Estates Committee. Mr. Arthur Brown, M.I.C.E. city engineer:—
Naylor Bros., Huddersfield £2,250 0 0
Claypham, South Lowestoft 1,881 0 0
H. B. James, Westminster 1,792 19 0
W. Gradwell & Co., Ltd., Barrow-in-Furness 1,701 19 8
Whitaker Bros., Horsforth, near Leeds ... 1,590 0 0
S. Thumbs, Nottingham 1,550 0 0
T. Smart, Nottingham 1,530 11 0
Bentley & Loch, Leicester 1,378 3 0
T. W. Pedrette, Stamford Hill, N. 1,320 0 0
G. K. Waghorn, Redcar 1,248 1 2
Leggott & Speight,* 48 Barclay St., Sunder-land 1,214 14 10
* Accepted.

OXFORD.—Accepted for the erection of a marmalade and jam factory, Park End Road, Oxford, for Mr. Frank Cooper. Mr. Herbert Quinton, architect and surveyor, 22 George Street, Oxford. Quantities by the architect:—
T. H. Kingerlee & Sons, Oxford £4,800

STOCKTON-ON-TEES.—For various works required in erection of new banking premises in High Street, Stockton-on-Tees, for the North-Eastern Banking Co., Ltd. Mr. H. Linton, architect, 13 Exchange, Stockton-on-Tees, and 60 Albert Road, Middlesbrough:—
J. Howe & Co., Whithy Street, West Hartle-pool £6,074 0 0
Allison Bros., Marsh Road, Middlesbrough 6,247 0 0
T. Hanby 5,927 0 0
A. J. Cooke 5,790 0 0
W. C. Atkinson* 5,450 0 0
J. Davison 5,250 12 0
* Accepted. [Rest of Stockton-on-Tees.]

TROWBRIDGE.—For the erection of a machine bakery at Court Street, Trowbridge, for the Trowbridge Co-operative Industrial and Provident Society, Ltd. Mr. Walter W. Snailum, P.A.S.I., architect, Church Street, Trowbridge:—
Wills & Sons, Bath £2,000 0
Hayward & Wooster, Bath 2,177 0
J. Long & Sons, Bath 1,963 0
Parsons Bros., Westbury 1,895 0
G. Moon, Trowbridge 1,807 14
E. Linzey, Trowbridge 1,550 0

WALLINGTON (SURREY).—For the erection of seven shops and houses at Wallington, Surrey. Messrs. Warran & Stupart, architects, 35 Green Lanes, Harringay:—

Whole work as specified.
S. Horwood, Croydon £12,530 0
Cropley, Epsom 10,750 0
C. H. Bursill, North Finchley 5,438 0
Hale & Co., Harringay 7,432 0
E. Frost, Tottenham 5,985 0
W. Roberts, West Croydon 6,007 0
W. Goddard, New Southgate 6,250 0
G. Jackson, Sutton 6,230 0

Alternate estimate, using cement cast in lieu of Portland stone dressings.

S. Horwood 12,452 0
Cropley 10,633 0
C. H. Bursill 7,350 2
W. Goddard 6,200 0
G. Jackson 6,160 0

Ex avating and clearing site.
W. Goddard 750 0
C. H. Bursill 704 0
G. Jackson 540 0
Cropley 536 10
E. Frost 475 0
Hale & Co. 450 0
S. Horwood 392 0
W. Roberts 360 0

WALLSEND.—For the erection of a convalescent block, isolation block, side wards, and covered ways, for the Wallsend and Willing-ton Quay Joint Hospital Board. Mr. Fleming Davidson, architect, Station Road, Wallsend:—
W. T. Weir, Howden-on-Tyne £2,770 0 0
Davison & Bolan, Blaydon 2,754 0 0
W. Kennedy, Jarrow 2,750 0 0
J. Ross & Son, Gateshead 2,550 0 0
W. C. Tyrie, Gateshead 2,520 3 0
Middleton Bros., Newcastle 2,520 0 0
S. Sheriff, South Shields 2,501 0 0
W. Cook, Willington-on-Tyne 2,401 0 0
J. W. Braithwaite, Heaton 2,294 10 0
W. W. Richardson,* North Shields 2,070 0 0
* Accepted. [Architect's estimate, £2,200.]

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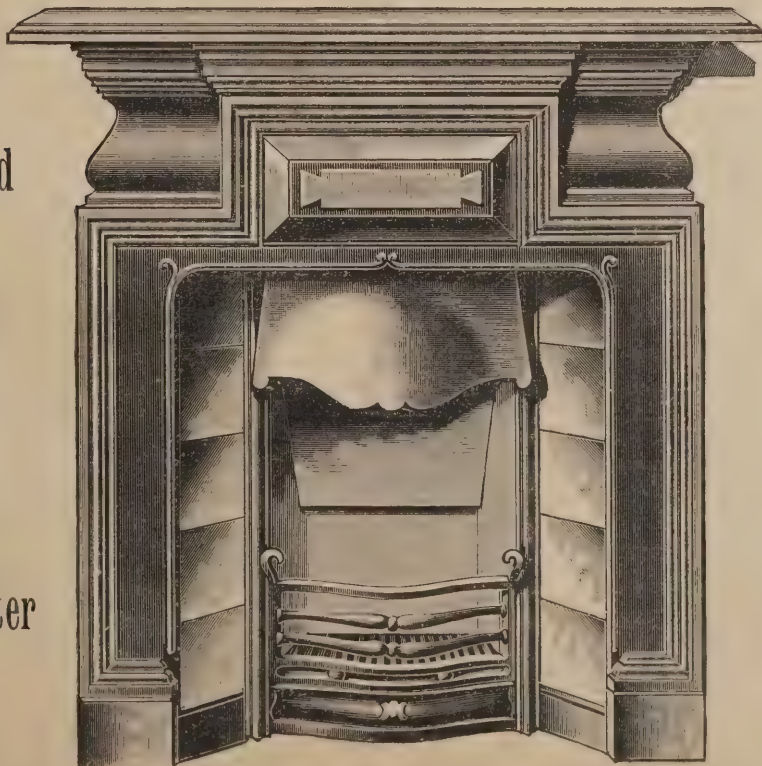
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F. W. Wale	1,750
F. Price	1,750
F. & W. Bettesworth	1,725
Hastings & Ladley	1,638
Pickering & Besant	1,535
C. Simmons,* Willesden	1,474

* Accepted.

COMING EVENTS.

Wednesday, May 21.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Mr. W. J. Andrew, F.S.A., on "Buried Treasure: Some Traditions, Records and Facts," 8 p.m.
BUILDERS' FOREMEN'S AND CLERKS OF WORKS' ASSOCIATION.—Ordinary Meeting at 8 p.m.

Thursday, May 22.

SURVEYORS' INSTITUTION.—Country Meeting at Cambridge (First Day).
ROYAL INSTITUTION.—Mr. M. H. Spielmann on "Contemporary British Sculpture"—I., 3 p.m.
SOCIETY OF ARCHITECTS.—Mr. Walter W. Thomas, M.S.A., on "People's Baths," 8 p.m.
INSTITUTION OF ELECTRICAL ENGINEERS.—Annual General Meeting. Annual Report of Council and Statement of Accounts. Election of Council, 8 p.m.

Friday, May 23.

SURVEYORS' INSTITUTION.—Country Meeting at Cambridge (Second Day).

Saturday, May 24.

ARCHITECTURAL ASSOCIATION.—Visit to Christ's Hospital, Horsham (Mr. Aston Webb, A.R.A., and E. Ingress Bell, architects).
SOCIETY OF ARCHITECTS.—Field Day at Winchester. Train from Waterloo at 9.15 a.m. Visits to the Westgate, County Hall and Castle, New Infantry Barracks in course of construction, the Cathedral, St. Mary's College, Wolsley Castle, the Old Town Walls and the Weirs, the Guildhall and Museum.

Monday, May 26.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. T. H. Mawson on "The Plan of the House in relation to the Garden," 8 p.m.
SURVEYORS' INSTITUTION.—Annual General Meeting.

Tuesday, May 27.

SOCIETY OF DESIGNERS.—Mr. B. Andrew Lillie on "Design: Its Demand and Supply in English History," 8 p.m.
SOCIETY OF ARTS (Applied Art Section).—Mr. Charles O. Allom on "The Decoration of the Piano-forte," 8 p.m.

Wednesday, May 28.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Professor J. Logan Lobley on "The Haslemere Congress of the S.E. Union of Science Societies," 7.30 p.m.
GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, May 29.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.
SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Miss Ethel Halsey on "Some Italian Paintings."
HOME ARTS AND INDUSTRIES EXHIBITION.—Opens in the Gallery of the Royal Albert Hall. Remains open till June 2nd.
ROYAL INSTITUTION.—Mr. M. H. Spielmann on "Contemporary British Sculpture"—II., 3 p.m.

Friday, May 30.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

Saturday, May 31.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Stirling Church and Castle.
NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Durham.

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Hay, best	do. 5 5 0	5 12 6	
Sainfoin mixture ..	do. 4 10 0	5 5 0	
Straw	do. 1 13 0	2 4 0	

OILS AND PAINTS.			
	per cwt.	per ton	per cwt.
Castor Oil, French ..	1 5 8	1 6 10	
Colza Oil, English ..	1 7 6	—	
Copperas	per ton 2 0 0	—	
Lard Oil	per cwt. 2 9 6	—	

	£ s. d.	£ s. d.
Lead, white, ground, carbonate do.	1 4 10	—
Do. red	do. 1 0 4	—
Linseed Oil, barrels ..	do. 1 12 3	—
Petroleum, American ..	per gal. 0 0 6	0 0 7
Do. Russian	do. 0 0 6	0 0 6
Pitch	per barrel 0 7 0	—
Shellac, orange	per cwt. 5 13 0	5 14 0
Soda, crystals	per ton 3 2 6	3 5 0
Tallow, Home Melt ..	per cwt. 1 12 3	—
Tar, Stockholm	per barrel 1 2 6	—
Turpentine	per cwt. 1 14 0	1 14 3

METALS.			
	per ton	per ton	per ton
Copper, sheet, strong ..	69 0 0	—	—
Iron, Staffs, bar	do. 7 0 0	8 10 0	—
Do. Galvanised Corru- gated sheet	do. 11 10 0	12 0 0	—
Lead, pig, Soft Foreign ..	do. 11 13 0	—	—
Do. do. English common brands	do. 12 18 9	—	—
Do. sheet, English 3lb per sq. ft. and upwards ..	do. 13 5 0	—	—
Do. pipe	do. 13 15 0	—	—
Nails, cut clasp, 3in. to 6in.	do. 9 5 0	—	—
Do. floor brads	do. 9 0 0	—	—
Steel, Staffs, Girders and Angles	do. 5 15 0	6 5 0	—
Do. do. Mild bars	do. 6 10 0	7 0 0	—
Tin, Foreign	do. 136 5 0	136 15 0	—
Do. English ingots	do. 135 0 0	137 0 0	—
Zinc, sheets, Silesian ..	do. 21 0 0	—	—
Do. do. Vieille Montaigne	do. 21 10 0	—	—
Do. Spelter	do. 18 10 0	18 15 0	—

TIMBER.			
SOFT WOODS.			
	per load	per load	per load
Fir, Dantzic and Memel ..	2 1 0	—	—
Pine, Quebec, Yellow ..	per load 4 7 6	6 0 0	—
Do. Pitch	do. 2 14 0	3 11 0	—
Laths, log, Dantzic	per fath. 4 10 0	5 10 10	—
Do. Petersburg	per bundle 0 8	—	—
Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0	—
Do. do. 4th & 3rd	do. 10 15 0	12 5 0	—
Do. do. unsorted	do. 5 12 6	6 10 0	—
Do. Riga	do. 6 15 0	12 10 0	—
Do. Petersburg 1st Yellow ..	do. 10 0 0	17 5 0	—
Do. do. 2nd	do. 9 0 0	12 10 0	—
Do. do. White	do. 7 5 0	12 10 0	—
Do. Swedish	do. 7 15 0	14 15 0	—
Do. White Sea	do. 13 5 0	17 5 0	—
Do. Quebec Pine, 1st	do. 11 10 0	24 10 0	—
Do. do. 2nd	do. 11 15 0	17 0 0	—
Do. do. 3rd & c.	do. 9 10 0	—	—
Do. Canadian Spruce, 1st ..	do. 7 10 0	12 10 0	—

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An Architectural Causerie.

Three Exhibitions. MR. HERBERT J. FINN'S collection of water-colour drawings now shown in the drawing-room of St. James's Hall, W., consists, as usual, mostly of architectural subjects. Mr. Finn loves to paint our great cathedrals in all kinds of lights, and he has here several pictures of Canterbury, York and Durham. The most important of these is perhaps that of the west front of York Minster, with the sunlight illuminating the tops of its towers and a blue haze graduating downwards to the ground and there mingling with the shadows of door and buttress. Mr. Finn has also devoted himself to Oxford and London. "The Spires of Oxford" is certainly a charming piece of work, and equally delightful are his two views of the Houses of Parliament, silhouetted against the mellow light of the setting sun. These are certainly among the best of Mr. Finn's drawings: they are far superior to the numerous other examples of crumbling cloister and time-eaten vault, where the rendering of the surface is not pleasing; the work is clean and sharp in itself, but the impression spotty and woolly (this is especially so in the water-colour of the cloisters at Magdalen, Oxford). Mr. Finn paints architecture as an artist; he impressionizes it; and while admiring his rendering of every change in light and colour, we feel that his work lacks that quality which only an architect's knowledge of architecture can give.

In two rooms at the Church House, Westminster, the small exhibition of the Church Crafts League is open till the end of this month. The exhibits include copes, rubbings, chalices, altar fronts, designs for stained-glass windows, &c.; but the features which give quality to the exhibition are a painting by Mr. G. F. Watts, R.A., the metal and enamel work of Mr. Nelson Dawson and Mr. Alexander Fisher, and two examples of Mr. Henry Holiday's new enamel on metal in relief. As a craftsman Mr. Dawson has long since established for himself an honourable name, and the very beautiful works he here exhibits—electric-light fittings, door-handles and latches, and several smaller objects—are worthy of that name. Apart from the beauty of the designs themselves, Mr. Dawson is especially pleasing in his actual treatment of the work in hand: he does not allow himself to be led astray by the "wrought with the hammer" theory; so that his surfaces, whilst certainly showing the manner of the workmanship, are reasonably even and free from blemish. Mr. Fisher's enamels are other examples of charming work. Mr. Holiday's enamel is, of course, quite different, because it is expressly devised for large scale work: the process is described in our issue for December 11th last. The effect of the

reared panels exhibited, though somewhat harsh at close quarters, would doubtless be good when seen from the body of the church. An interesting exhibit is an altar front by T. Stirling Lee, to be carried out in beaten copper frame with brass panels for Cathorpe Church, near Rugby. Mr. F. M. Taubman shows a beautiful little figure of "An Angel," portion of a monument; Mr. W. Goscombe John, A.R.A., a model of the memorial to the late Canon Guy placed in the chapel of the Forest School, Snaresbrook, executed in copper-gilt with red marble frame; Mr. F. W. Pomeroy two sketch models of statuettes; Mr. John P. Seddon the base of a column in majolica ware for a marble shaft, and drawings of the four windows recently erected from his designs in Llandaff Cathedral; a model

than that it contains a small drawing by Mr. Bernard Partridge of Les Halles at Malines: but, nevertheless, for every draughtsman, be he architectural or not, there is much to interest and to learn from the many sketches by "Punch" artists now shown at 37, New Bond Street, W.

Science and Art. DR. WALDSTEIN, late Slade Professor of Fine Art at Cambridge, is engaged in the very laudable endeavour to establish an Imperial British Academy of Arts and Sciences. He says that "the present organisation of the Royal Society as representing science and of the Royal Academy as representing art, the complete absence of such organization for the other departments of science and art, and, finally, the failure to represent the



CHURCH OF ST. MICHAEL AND ALL ANGELS, MANNINGTREE, ESSEX: PROPOSED REBUILDING.
GEOFFREY LUCAS, A.R.I.B.A., ARCHITECT.

of a church at Caer-Rhûn, near Conway, by Mr. Herbert L. North, and other church work by the same architect; some designs for church-decoration and fittings by Mr. O. Maxwell Ayrton; photographs of the new rectory at Harston, Leics., designed by Mr. W. H. Ward; and a design for a village cross at West Meon by Mr. C. Harrison Townsend. In looking over this exhibition it is well to remember that the principles on which the League is based do not allow that church furniture should be kept in stock, every article having to be specially made for its own particular place and purpose: so that most of the work of its members can only be seen by visiting the churches where it has been executed.

The third exhibition which we have to notice is one which has no other architectural claim

inner relationship, the unity of methods and aims of work connecting the several departments—these have gone far to confirm the active misconceptions of the true nature of science and art, if they have not created them." Dr. Waldstein also points out the unfortunate effects of our narrow conception of the meaning of the words science and art, and expresses the opinion that such an institution as he suggests would help to federate science and art in a strong and useful alliance. There can be no doubt that, even so far as architecture is concerned, the majority of persons fail to see that there is no such thing as an art of architecture apart from a science of architecture: they draw a distinction between the two, thinking science to be the construction and art the embellishment: yet such a belief is totally wrong, for no build-

ing can be architecturally satisfactory if it is constructively wrong, and no amount of embellishment can remedy the fault. It is the common custom, especially among artists, to look at architecture from a supposed aesthetic standpoint: they speak in glowing terms of the curve of an arch or the massiveness of piers. But the first and essential requirement of that arch or that pier is fitness; and if it can be conclusively shown that a flatter or a greater curve would have more exactly suited the needs, or that the pier is too slight or too heavy, then no amount of artistic rhetoric can weigh against such facts. Briefly, everything must be scientific—that is, logically correct. And any Academy which embodies such primary considerations is certainly in the vanguard of progress.

THE BRICKLAYING QUESTION.

A MANIFESTO AND A CHALLENGE
BY THE MEN.

THE president and the secretary of the Operative Bricklayers' Society have published a manifesto in the "Times" in reply to the charges made against themselves and bricklayers in general. They say: "Our Society does not recognize nor inculcate, either by rules and laws written or unwritten, that it is a sound policy to restrict the laying of bricks to any given number per day, but recognizes and maintains the right of any employer to discharge any man whom he considers does not do a fair day's work for the wages he is receiving. That is the principle upon which our Society works, and we challenge contradiction. Mr. Stewart, building manager of the British Westinghouse Co., proves that what we say is correct, for he says: 'I will say with regard to the union men that if our work has been rapidly executed it has been greatly due to the interest that has been taken by the representatives of the unions in securing for us the best men that could be obtained.'"

Replying to the statement that thirty years ago the bricklayers employed on railway tunnel work in London laid 1,200 bricks a day, the bricklayers' officials say: "We have every reason for believing that the 'tunnel tigers' are as voracious as ever; and it may be information for those who are interested in this question to know that the men who were in the habit of laying 1,000 bricks per day twenty years ago were men who were paid a penny an hour above the trade-union rate, and where the same policy is adopted to-day similar results will follow. Those men who are said to have laid 1,000 bricks per day would be men engaged upon cottages or work of a rough description, and the same results can be found to-day if the men are paid accordingly. . . . Again, to say that the *maximum* of 400 (or any other number) bricks per day is the 'recognised' limit for dwelling-houses, shops and building premises built by a private contractor is a wilful perversion of facts, as no such *maximum* exists anywhere but in the heads of confused and irresponsible agitators. . . . It appears that Mr. Stewart, the building manager for the British Westinghouse Company, has submitted to the 'Times' some figures relative to bricklayers' work which have called forth a whirlwind of criticism from a number of persons who evidently do not understand the trade. The mere fact that high averages may be reached on a certain class of work is no proof that they can be reached on other classes of work, and this is apparently what most of our critics fail to realize. That a great number of bricks would be laid each day we are prepared to admit; the quality of the work, the state in which it has been left for finished, the absence of arches, pilasters, &c., which necessitate the devoting of much time to plumbing, levelling, &c., all favour high speed and good records; but we hope we will be pardoned when we decline to accept Mr. Stewart's figures as absolutely correct. Notwithstanding Mr. Stewart's assurance, we decline to believe that the bricklayers working on the chimney at Birkenhead laid upon an average 1,976 bricks per day. To have reached any such average would mean that the chimney would have to be scamped to such an extent as would endanger its stability. . . . When people make comparisons between the amount of work done for the Westinghouse Co. and that of the contractors, it

ought to be remembered that the Westinghouse Co. were building for themselves—had only themselves to please concerning the quality and finish of their work. Not so with the contractors, who in most cases have to satisfy their client, the architect and the clerk of the works; and no architect or clerk of works would allow a contractor to finish his work in the fashion that is necessary for attaining high rates of speed. As an evidence of our desire to be just in this controversy, we challenge any architect of position or any clerk of works who has had a few years' experience in the erection of brick buildings to say that the class of work which can be secured by high rates of speed, no matter how well paid for they may be, is the class of work they are prepared to accept. . . ."

A pamphlet has been issued by the Leeds Building Trades Federation as a reply to the statements made in the "Times" and elsewhere with regard to trade-unionism and bricklaying. It is in reality a full report of a meeting held on February 6th last at Leeds under the auspices of the Federation, from whom it may be obtained, price 1d. (Three Legs Inn, Lowerhead Row, Leeds).

R. I. B. A.

HOUSE AND GARDEN PLANNING.

By T. H. MAWSON.

A MEETING of the Royal Institute of British Architects was held on Monday last, when the chair was occupied by Mr. William Emerson, the president. After the minutes of the previous meeting had been confirmed, the death was announced of Mr. H. D. Shepard, Associate: he won the Institute medal for essays in 1869. Mr. Thomas H. Mawson then read a paper on "Unity of the House and Garden."

He said that at no time, if the scheme were to be successful, could the house and garden be divorced from the surroundings; all must be viewed together in unity. Where there was perfect freedom of choice the three great considerations in deciding upon the site and position of a house were climatic conditions, the nature of the subsoil and the aspect; for no matter what the prospect offered, it was unwise to build upon the north or north-west or north-east side of a hill or knoll. As to the site itself, for health, beauty, luxuriance and ultimate cheapness, select a site with an under-stratum of gravel or marl and a good surface covering of loam. The first general question to be decided was whether purely artificial considerations were to be all-sufficient, or whether those considerations were to hang upon or be guided by the larger aspect fixed and abiding. The architect and garden designer must realise that the *home* is the precious thing and not the house. The needs of the proprietor should be clothed with a character to accord with the surroundings and expressive of his status. The impressions and inspirations of the spot should guide the architect and garden designer both in respect to the preparation of the plans and also of the elevations and of the garden scheme. In the absence of a skilled designer, where the laying-out of the garden was entrusted to the local nurseryman the unity of the house and of the garden might nevertheless be secured, for it was open to the architect to suggest in the most unmistakable manner by his plan the general laying-out of that portion of the site which most nearly concerned the architecture. Seldom when a plan of a country house was given did we find any indication of the compass points thereon: yet this deserved every consideration. Mr. Mawson proceeded to show several plans of country houses and gardens, illustrating how by careful arrangement it was possible to secure the most harmonious results. He also spoke a word for the orchard, and in conclusion observed that he had referred to neither the formal nor the landscape school: there was work in plenty for both: the help of both was needed. If we could divest ourselves of some of the prejudices called schools and devote our energies to earnest and unstinting study, and apply that study to the perfection of our craft, and if we could allow our professional

jealousies to give place to a spirit of mutual helpfulness, we might yet do something to advance the peaceful arts of the country.

A discussion followed in which Mr. Milner, Mr. Butler Wilson, Mr. R. S. Lorimer, Mr. Leonard Stokes, Mr. E. W. Hudson and Mr. Inigo Triggs took part.

EXCAVATIONS AT SILCHESTER.

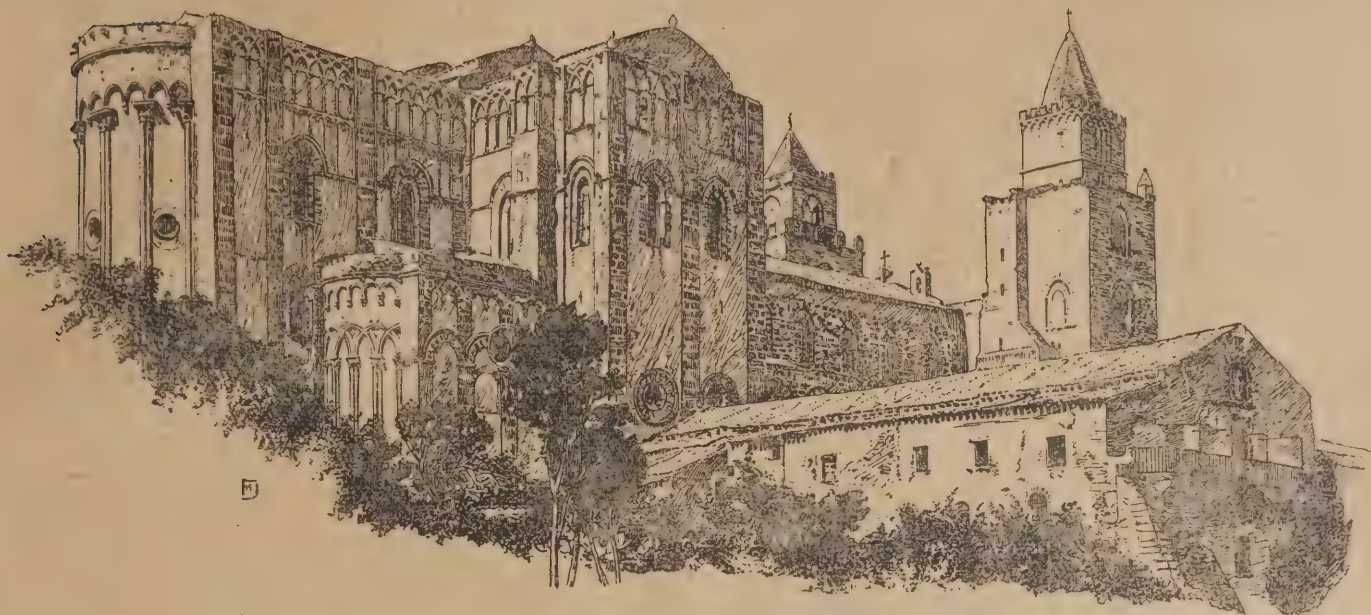
A REPORT has just been issued of the excavations which have been carried on under the auspices of the Society of Antiquaries since 1890 on the site of the Romano-British Calleva. Here walls nearly 2 miles in circumference enclosed a rudely hexagonal space, which was divided into blocks of buildings by streets at right angles one to another. The lower parts of a number of complete houses, large and small, have been laid bare, carefully examined and planned, and again covered up after removing anything of value. Two square temples, a circular one, a small shrine, a Christian church, probably of the fourth century, a town-hall and the adjacent market-place, buildings with private baths attached, apparently an inn, and another group, supposed to be dye-works, have also been explored. The excavations have revealed nothing to imply a military occupation, and the area greatly exceeds that of Roman camps or stations for a garrison, but everything testifies to the existence of a civil community. Some mosaic pavements have been discovered, with the usual "finds"—coins, pottery, glass, bone, bronze and other metallic objects—which have been deposited in the museum at Reading. Rather more than three-quarters of the site has now been examined at a cost of nearly £6,000, raised by subscription, and the Executive Committee purpose, if further support be given, to complete the work of excavation.

A CEILING PAINTING BY LEONARDO.

SIGNOR LUCA BELTRAMI, the eminent Lombard architect who restored the Sforza Castle at Milan, has just published a 4to volume entitled "Leonardo e la Sala delle Asse." Only 300 copies have been printed. It contains an account of the discovery of the Leonardo decorations in the Sala delle Asse, one of the chief rooms in the apartment of Ludovico il Moro in the Castle of Milan, and explains the method adopted in their restoration. For several years it was impossible to make investigations in the castle, because the hall which was believed to be that of the Asse was used as an infirmary for the horses of an artillery regiment. In 1893, however, the hall was evacuated and a German specialist who was visiting Milan at that time discovered on the vaulted roof of the hall which Signor Beltrami believed to be the Sala delle Asse traces of painting and a large painted shield bearing an inscription in gold letters in which mention was made of the alliance contracted in 1496 between Ludovico il Moro and the Emperor Maximilian against Charles VIII. Closer examination revealed the general design of the decoration of the hall, the roof of which had been painted to resemble a bower with branches entwined round several shields bearing other inscriptions. The subject and the character of the design left no doubt as to the authorship of the work, which was clearly that of Leonardo. For some years, however, it was not possible to undertake a restoration of the painting, but last year a Milanese advocate, Signor Pietro Volpi, provided funds sufficient to enable a young painter of distinguished ability, Signor Ernesto Rusca, to undertake the difficult task. After carefully cleaning all the plaster and noting accurately every trace of Leonardo's composition it was possible to reconstruct and to restore the whole design.

The Church of St. Mary, Titchhurst, was recently reopened after being restored at a cost of £2,000.

The Restoration of All Saints' Church, Haggerston, has been carried out from the designs of Messrs. Saunders, of 4, Coleman Street, E.C.



THE CATHEDRAL, CEFALÙ, FROM THE NORTH EAST.

SICILY AND ITS ARCHITECTURAL MONUMENTS.—VIII.

By F. HAMILTON JACKSON, R.B.A.

(Concluded from p. 191, No. 379.)

THE north coast of Sicily from Palermo to Mazza is even more beautiful than the other coast-lines, and the railway follows it in the most obliging manner, giving the traveller the benefit of constantly changing groupings of mountain, bay, and coast foreground, each more lovely than the one which preceded it, until the eye is almost satiated. No doubt with a recognition of this likelihood, the direct train is so timed that the sun sets shortly before the line quits the coast to dive through the mountains to Messina, so that one's last recollection of the landscape is bathed in the sunset glow so characteristic of the beautiful island. The line passes behind Cape Zaffrano, below which are the ruins of Soluntum and the decayed rococo palaces of Bagheria, and several villages of considerable antiquity, one of which, Altavilla, possesses one of the oldest Norman churches, founded by Robert Guiscard in 1077. Termini Imerese is the junction for Girgenti, and one of the busiest provincial towns in Sicily. It was probably an ancient Phœnician station, and was founded as a town by the Carthaginians in 407 B.C. after the destruction of Himera. A few remains have been excavated, and the springs are still utilized for a modern bathing establishment. Himera lies a few miles farther along the coast, above Buonfornello. This place was the westernmost town of the Greeks on the north coast of Sicily and the birthplace of Stesichorus. Here it was that the great defeat of the Carthaginians under Hamilcar, by the Greeks under Gelon and Theron, took place, in revenge for which Hannibal Gisgon razed the city to the ground; and the river called now Fiume Grande, but anciently Himera Septentrionale, together with the Himera Meridionale, now the Fiume Salso, which flows into the African sea, has in several periods formed the dividing line of political districts. Twelve miles further, the bold isolated rock of Cefalù projects into the sea, at the foot of which is the thriving town and the fine cathedral with the magnificent mosaics in its sanctuary, all of which owe their being to King Roger the First.

The ancient town, called Cephalœium, was

on the rock, and though the first historical mention of it occurs in 397 B.C., the prehistoric fragment of building which still exists proves that it is of much greater antiquity. Its name may be either a Sicilian corruption of the Latin version of the Greek word "kephale," a head, or a derivation from the Punic word "cefalua," which means a steep rock, either of which words describes the place very well. Diodorus says that the Sicanians, 1200 or 1300 years B.C., had retired to the northern and western extremities of the island, and it seems probable that the prehistoric building is due to them, especially as he mentions that they built their towns on the top of the mountains for fear of robbers. It was never very important, though it struck money of its own. It was twice besieged by the Saracens, and on the second occasion, in 858 A.D., was taken by them and became the last town of the section Val Demona. Its bishopric is fifth in point of antiquity among the bishoprics of Sicily, and in 865 A.D. one of its bishops, named Nicetas, was present at Constantinople at the eighth synod. In Norman times the bishop was appointed by the king, and sat in the eighth place in the ancient parliament. The principal attraction of Cefalù is King Roger's cathedral, founded by him in fulfilment of a vow made during peril of shipwreck in the year 1129 that he would erect "to the name and glory of the most holy Saviour, a cathedral church and also endow it with very rich gifts" immediately he arrived safely at any place. This is the tradition related with some dramatic power in a MS. now in the archives at Cefalù, called "rollus rubeus," and compiled in 1329 by a certain Roger the Notary by order of the bishop of the time. In the oldest diploma of gift, however, dated 1145, while King Roger was living, no mention is made of the vow. In that document he says the temple is erected on account of the sentiment of gratitude which he felt towards the divine Saviour, Who had entrusted to his hands the sceptre of command. "A worthy and reasonable thing it is to build a house for our Lord, and to found a refuge in honour of Him who has so benefited us and has decorated our name with the ornament of Kingship." Another document, ascribed to Ugo, bishop of Messina in 1131, states that on the day of Pentecost of that year the church was founded by King Roger to the honour of the Holy Saviour and of the Blessed Apostles, Peter and Paul, for the benefit of the soul of his father of pious memory, Roger first count of

Sicily, and of his mother, Adelaide, the queen, and also for his own redemption and satisfaction for all his sins, as well as to succour the poor and travellers. This is confirmed by the inscription at the entrance of the church, and an ancient tradition relates that the king, accompanied by many people, pointed out with his royal sceptre the site it was to occupy. Also that he brought down the houses of the citizens from above on the rock, seeing that on account of the want of water and the difficulty of the ascent the city was dwindling. Fazello says that he had the columns for the cathedral brought from the ancient church on the mountain, and it is thought they once formed part of a temple of Jupiter which stood on the headland.

The church is a Latin cross on plan. Of the sixteen columns of the nave arcade fifteen are of granite and the sixteenth of cipollino, a speciality of the Madonia mountains. The external plinth of large blocks of cut stone probably also came from the ruins above. The length is 243ft. and the width 92ft. The nave is double the width of the aisles, and east of the transepts are three apses. The façade has two lofty towers connected by a pillared portico beneath which is the original doorway. Above this is an interlaced, pointed wall arcade, flanking the central window, all ornamented with Norman zigzags, and higher still is another arcade of very curious form surmounted by a slight billeted cornice. The nave is lower than the transepts and choir, around the top of which runs an arcading resembling the lower feature of the western façade interrupted at the apse by tall coupled attached columns, from which spring small arches in couples falling in the centre on to a small corbel. Massive piers interrupt the arcading at the points where the vaulting arches take their rise. The interior has been a good deal modernised, the western bays of the choir having frescoes and stuccoes of the seventeenth century and the side aisles vaulted and stuccoed, while almost as much whitewash has been expended upon the nave as if the authorities were English churchwardens of the last two centuries. The greater part of the roof is a restoration of 1559, though the name of Manfred and the date 1263 was to be seen on one of the beams. The font of fossilitic marble, of a heavy cistern-like shape, is supported on a short column with twisted flute. It is decorated with roughly-carved lions in relief with highly projecting heads, 6ft. across and very quaint. The proportions are exceedingly lofty and dignified, and



FACADE OF CATHEDRAL, CEFALÙ. DRAWN BY F. HAMILTON JACKSON, R.B.A.

in the transepts the plainness of the walls is relieved by the appearance of a little arcade at clearstory height. At the entrance to the choir are two thrones, that on the left for the king and that on the right for the bishop, a similar arrangement to that at Monreale, where, however, they are nearer to the altar. The other fittings are late Renaissance, but the singing galleries in the nave are supported on ancient columns.

The mosaics are in the central apse and one bay of the choir westward from it. The selection of saints on one wall confirms the tradition that King Roger imported monks from Mount Athos to execute them, and their splendour and excellence also make it exceedingly likely. The semi-dome of the apse is filled with a colossal Christ, rather Jewish in type and on the whole successful; the vault of the first bay bears four cherubim and at the springing of the arches four half-figures of angels. Below the Christ is the Virgin in the traditional Byzantine attitude of adoration, with an angel on either side of her. Below her again are the twelve apostles in two rows of six each, divided by the pointed window in the east wall. On the north wall, commencing from below, we have SS. Gregory, Augustine, Sylvester and Dionysius, above them SS. Peter, Vincent, Laurence and Stephen. Higher still are the prophets Joel and Amos and Obadiah, while at the top are Moses and Hosea, with a circle between them tenanted by Melchizedek. On the south side, commencing again from the bottom, we have SS. Nicholas, Basil, Josephus and Gregory Theologos, above them SS. Theodore, George, Demetrius and Nestor. Above them

are the prophets Jonas, Isaiah and Nahum, while at the top are David and Solomon with Abram between them in a circle. The lettering, as at the Cappella Palatina, is partly Greek and partly Latin, showing that the traditional ascription to the Calogeri is accurate. The columns of the sanctuary are covered with mosaic, and the corbels of the vaulting shafts also, which simulate a cap with volutes and acanthus scrolls. The vaulting shafts, which are green and purple, are continued in the mosaic with a twisted shaft to the string above the cornice; the mixture of actual relief and representation is curious. These mosaics were carefully restored under Ferdinand the Second in 1859 by the chief of the mosaic school at Palermo. The walls of the portico between the towers were once covered with mosaics representing King Roger and his successors in their relation to the church, but of these no trace remains. The sarcophagi of Henry the Sixth and Frederick the Second, now in the cathedral at Palermo, once stood in the transepts here, probably provided by Roger for himself and his wife. Frederick the Second first astutely sent the bishop on a mission to Damascus, and in his absence effected the removal. On his return he promptly excommunicated the king and emperor until he should return the sepulchres to Cefalù, but finally agreed to remove the ban in return for certain advantages conceded to the cathedral. According to a book published at Cefalù in 1656, the clothes of King Roger, woven of silk and gold, were then preserved in the church, and on February 27th in each year there was a funeral mass in commemoration of his death, when they placed the things on a

raised place, singing the office solemnly in the presence of the bishop, the magistrates and many of the citizens who prayed for the soul of their benefactor. This same book says that King Roger first built the church of S. George at the foot of the hill in fulfilment of his vow, because he had appeared to him during the tempest, and at that time the arrival of the king was to be seen painted upon the wall. This church falling into ruin was restored by the seamen of Cefalù and dedicated to S. Leonard, being made a convent for poor girls who were there educated and fitted for marriage. The cloisters of the cathedral are said to resemble those of Monreale, and may have done so originally, as the arcade appears to be borne upon coupled shafts and the arches are pointed, but, what with disrepair and patchings up, they are in a very bad state. In the street which leads to the Porta della Terra is an ancient building called "Osterio Magno," stated by Passafiume to have been part of a royal-hotel built by Roger, whose arms appear at the top of the windows. Other houses have windows with slender shafts and pointed heads. S. Anthony of Padua is said to have built a monastery here, that of S. Francesco, and a chalice which he used was long preserved in it.

The ascent to the castle is by means of very steep and slippery zigzags in the rock. The gate of the town still remains, giving entrance to a malodorous yard which goats have evidently inhabited for a long time. Passing through this, one ascends by more slippery zigzags over a rock which is of a crystalline nature, called "lumachella," to various remains of the ancient city, which still retains its walls round a great part of the circuit, though these are not of very great antiquity, as is the prehistoric building, the most interesting ruin on the rock. The lowest courses of this are polygonal—above these are several courses of large rectangular stones, and to the same period two doorways with mouldings of a Greek type belong, within which may be seen the holes which received the pivots upon which the doors turned and those for fixing the bar which kept them closed. Within is a Roman vaulted chamber, perhaps a sepulchre, while above are remains of a building used as a Christian church, as its semicircular apse denotes. The greater part of the walling here and above the more ancient work on the exterior, however, appears to be Saracenic. It has several arch openings within and considerable admixture of Roman tiles with the fragments of stone. Cavallari groups this building with the walls of Eryx, since there is evidence of the use of the chisel, that is to say, that while it is not so early as the Sardinian prehistoric buildings or those of Pantellaria, it was built at a period of such antiquity as to make the Doric temples look modern! At the summit of the rock are the remains of a Norman castle and several cisterns wrought with walls and vaults of masonry.

From this point of vantage on a clear day a wonderful panorama is spread before the spectator. The eye ranges along the coast-line from Milazzo far to the east to the mountains beyond Palermo to the west; range beyond range their filmy veils retire farther and farther away, the more distant and loftier appearing over the depressions in the nearer chains, with an occasional wisp of cloud playing round their finely-sculptured silhouettes, while from one's feet the sinuous line of the coast breaks into bays and runs out into headlands, defined by the blue of the sea and the creamy white of the breaking wave, which in that serene sea is only just strong enough to turn over and fall on the shore in fine weather. The lower land near the sea is rich with vegetation, amid which white and red-roofed houses appear, clustering here and there into hamlets or gathering into towns of greater or lesser importance, seated on an eminence or straggling from the lower land up the steep side of a hill. The sites of many ancient cities are in view, and the interest of historic memories mingles with the delight of the beautiful landscape, while to the north-east the amethystine shapes of the Lipari islands appear with the ever-smoking Stromboli, pale silhouettes of fine form fading almost to nothingness as they approach the sea-line. It is a scene of fairy-like beauty, and the Sicilian traveller can wish to carry away with him no better souvenir of that delightful land.





"PHOTO-LITHO." R. J. EVERETT & SONS, 55 LUDGATE HILL, E.C.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

If each generation were allowed and expected to build its own houses, that single change, comparatively unimportant in itself, would imply almost every reform which society is now suffering from.—NATHANIEL HAWTHORNE.

Our Plates. The house at Llangynwyd is proposed to be erected of local one up to the string or first-floor level, and above this of rough-cast with stone angle pilasters slight projection. The roof is to be covered with Welsh green slates in diminishing courses. The eaves will have a good projection and be plastered on the soffits. Internally the hall will be panelled to the height of the doors, and above this eventually a coloured plaster frieze in low relief. The cornice and ornamental ceiling will be treated in colour. The plan provides for eight bedrooms, a linen store, &c. The landing on the first floor, which is large, well lit and planned with a fireplace, will be treated as a gallery with panelled dado and coved ceiling. The other rooms will be treated in the ordinary way. Mr. J. Percy Hall, A.R.I.B.A., of 6, Victoria Grove, Kensington, W., is the architect.—The design for the proposed rebuilding of St. Michael and All Angels' Church at Manningtree was prepared by Mr. Geoffrey Lucas, A.R.I.B.A., of 5, Bloomsbury Square, W.C. The present church, which stands on a very limited and enclosed site in the main street, is of no great age or architectural interest, and was considerably altered and enlarged about 1821. All of this that is retained in the proposed rebuilding, which, except for the porches and vestries, covers the same area as the existing church, is a portion of the north wall containing three traceried windows—respectable enough of their kind but replacing the original ones dating from the time of Archbishop Laud—and the two old panels reused on either side of the entrance doorway. The seating, which is by both benches and chairs, is for 400, necessitating a western gallery with a staircase arranged over the entrance, and the choir being kept as small as possible. The organ is in a gallery at the east end of the north aisle, over the vestry, which latter has a small sacristy opening out of it. The barrel-vaults are of plaster with oak cornice, and the beams and the walls have a high painted wood dado. The drawings illustrated in our centre plates and on p. 223 of this issue are hung in the Academy Exhibition.

The Paris Bourse. THE first stone of the extension of the Paris Bourse on the north side was laid on May 14th. A copper-plate bearing a plan of the building with the extension and the following inscription was affixed to the stone:—

Année 1902.

Agrandissements du palais de la Bourse
exécutés aux frais et par les soins
de la Compagnie des agents de change de Paris,
M. de Selves, préfet de la Seine,
M. de Verneuil, syndic des agents de change,
M. Cavel, architecte.

Pose de la première pierre le 14 Mai 1902.

Impressions from this plate have been taken to be presented as souvenirs to the members of the Stock Exchange. The original building of the Bourse was designed by the architect Alexandre Théodore Brongniart (1739-1813), who laid the first stone in 1808, but did not live to witness its completion.

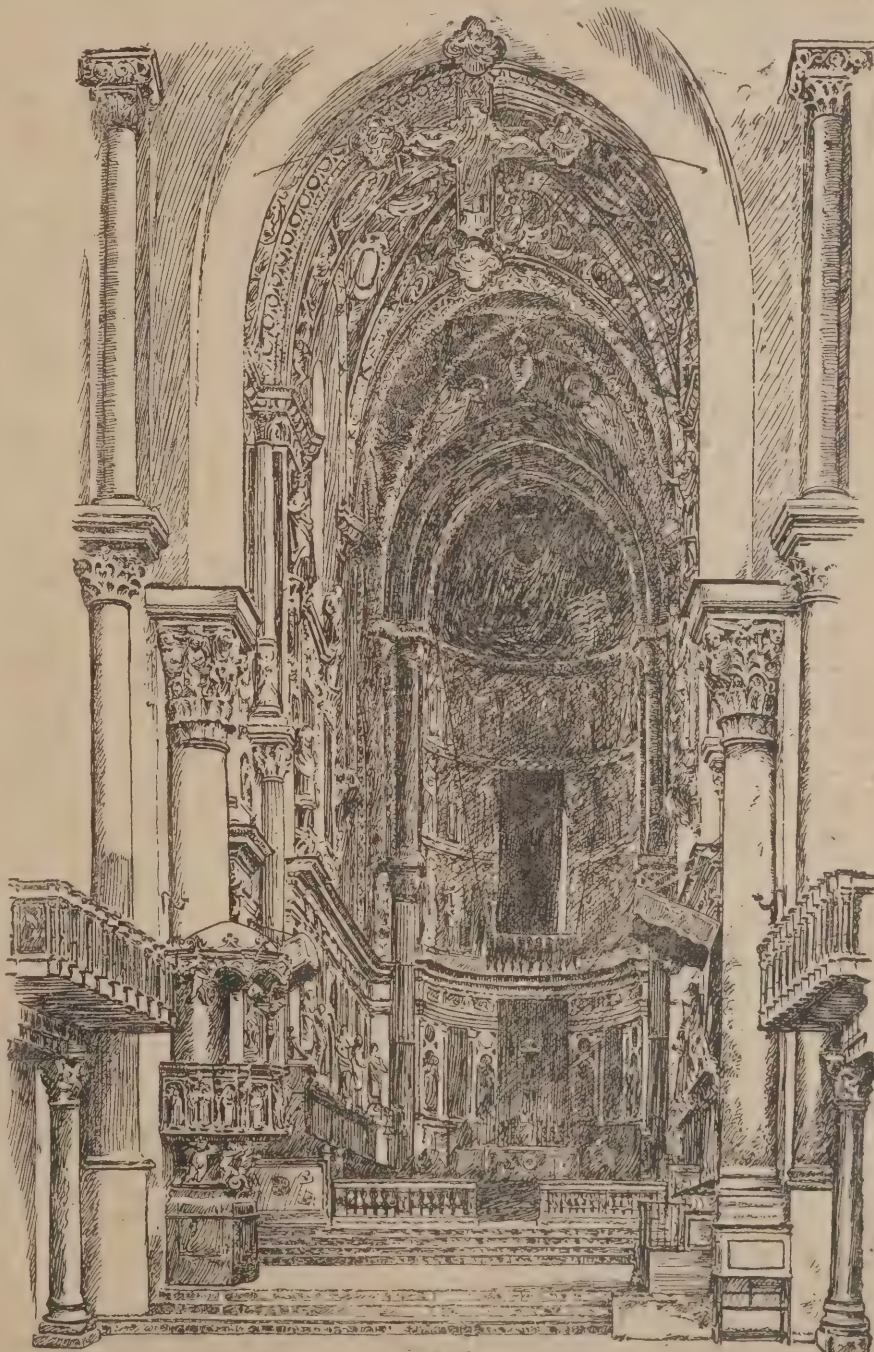
The Academy and Rodin. MR. HARRY QUILTER draws attention to the fact that when M. Rodin sent a work to the Royal Academy exhibition in 1886, then even more deficient in its sculpture portion than at present, it was promptly rejected by the Hanging Committee. The work refused was a bronze representing a group of children which the sculptor called "Idylle." M. Rodin had been represented at the Academy at least once before this rejection, when in 1884 he contributed "L'Age d'Airain" to the exhibition. The late Mr. W. C. Marshall was responsible for the arrangement of the sculpture in the year of M. Rodin's rejection. "The incident was interesting not only in itself but as a comment on

the enlightened judgment and encouragement of art, which are, we know, characteristic of the Royal Academy. About the same date the Grosvenor Gallery gave place to some small works by a young sculptor, and by so doing afforded Sir Frederick Leighton, as he was then, the opportunity of obtaining for himself and the glory of the Royal Academy Exhibition the 'Icarus' of Mr. Alfred Gilbert, not perhaps the least admirable of the works executed by that talented sculptor. The two events fit nicely together, and the latter is specially worthy of remembrance, for one of Leighton's most splendid characteristics was the uniform help and sympathy he showed to young and struggling artists."

The Question of Lightning Conductors.

IN reply to a correspondent who recently asked in the "Standard" "to what extent and to what distance a lightning conductor is protective to a building," Mr. Killingworth Hedges, M.I.C.E., said that the question was having the consideration of the Lightning Research Committee (of which he is the hon. secretary), and that until their investigations were completed he could not answer the question officially; but in preparing the specifications for the protection of St. Paul's Cathedral

and Westminster Abbey he has assumed that there is no area of complete protection in the neighbourhood of a conductor, and that the only way to shield a building is to multiply the conductors and to inter-connect them and the iron-work about the roof, thus forming a sort of network, which will receive any stroke and distribute its action over the whole system, which must have many suitable earth connections. He quoted from the extract of Observation No. 30: "Golders Hill, Hampstead, protected by several conductors, erected presumably by London County Council, attached to chimney stacks. Lightning struck the vane close to a chimney, made hole in pargeing, and did some damage." Observation No. 28: "Shire Oak Brewery, Wall-sall, chimney (70ft. high) struck and damaged on opposite side to that to which a conductor was attached." In this case the point struck was only a few feet from the conductors, and the damage was probably due to the absence of a corona or cap to the chimney. Lightning protection has for some time been the only non-progressive application of electricity, and we daily see lightning conductors erected in a manner which can be shown, both by laboratory experiments and by actual reference to lightning strokes, to be a source of danger instead of acting as safeguards to the building; also the



CEFALU CATHEDRAL. DRAWN BY F. HAMILTON JACKSON, R.E.A.

misleading belief of an area of protection is the cause of the erection of an isolated rod, for instance, on a church tower, while the rest of the building has no conductor, or, what is more important, no metallic connection to earth."

The New Schools at Horsham.

A PRIVATE visit of about 250 persons was recently paid to the new Bluecoat Schools at West Horsham, of which Messrs. Aston Webb and E. Ingress Bell are the architects and Messrs. Longley & Co., of Crawley, the contractors. The estate secured by the Governors of Christ Hospital Schools consists of 1,200 acres, of which 120 acres are utilised for school purposes. The buildings and pleasure grounds occupy 20 acres, and more than 100 acres are devoted to playing grounds. The schoolhouses are named after old boys, and over the doorway of each is a sundial. The carving of the Oregon pine roofs in the chapel and dining hall was much admired, while many watched with interest the statues of saints, which were being prepared for placing in their respective positions. The pictures, too, came in for considerable attention. A large quantity of scholastic furniture and books from the old school has been brought down to the new buildings, as well as furniture and bedding for the boarding-houses. The boys are expected in residence this week. Mr. Charles Longley has supplied some interesting figures showing the magnitude of the work which his firm has undertaken. It appears that 20,000,000 bricks have been used, 1½ millions of tiles, 31,000 tons of sand, 5,000 tons of cement, 15,000 tons of shingle, 5,000 tons of coke-breeze, 21,000 yds. of wood-block flooring (equivalent to 5 acres), and 100,000 cub. ft. of Bath, Portland and York stone; the approximate amount of tonnage being 150,000 tons. In addition, there are 40 miles of hot-water pipes and 98 miles of electric wires.

Mr. Spielmann on Modern British Sculptors.

ON Thursday last at the Royal Institution Mr. M. H. Spielmann delivered the first of three lectures on the modern school of British sculptors, which, he said, was now at its birth, "there having hitherto existed no national tradition." He pointed out the great share in this development through Dalou and Professor Lanteri on the one hand, and Onslow Ford and Alfred Gilbert on the other. The characteristics of sculpture and the vigorous and more virile conceptions of to-day were contrasted with the effete nymphs and graces of the past generation—"all dummy sisters from the same dummy mould"—and the spirit which inspires modern work was explained. The theory of the nude and of drapery in art were touched on, and the frivolous buyers of such trivialities as "The Veiled Face" were unsparingly criticised. The actual inception of the modern school was shown to date from the inspiration of Alfred Stevens, whose qualities were enlarged on by the lecturer. Examples of Calder Marshall's and Woolner's work were illustrated to show the reversion to the so-called antique, and the subsequent, though slow, emancipation was traced through sculptors such as Boehm and Foley. Mr. Armstead (the oldest of our sculptors, yet touched with the modern spirit notwithstanding), Mr. Lawson, Mr. Simmonds and Mr. Bruce-Joy were spoken of, and nine views of Mr. Brock's chief works were displayed, and his design for the Queen Victoria Memorial was contrasted with Señor Querol's fantastic memorial to King Alfonso XII. for Madrid. The reproduction of "La Darse," by Carpeaux, was given in order to explain the turning of Mr. Hamo Thornycroft towards the antique—shown by several examples, including the fine design for the statue of Edward I. originally intended for Blackfriars Bridge, "which was never carried out, as the artistic efforts and enterprise of the City of London became exhausted by the initial competition." Mr. Roscoe Mullins and Mr. Swynnerton were considered, and then some attention was given to Onslow Ford, and a warm but judicious tribute was paid to his great ability. Works by Mr. Hope Parker and Lord Ronald Gower were displayed, and the lecturer then spoke of the genius of Lord Leighton as exemplified in his "Athlete struggling with a Python" and the "Sluggard." The series is to be continued this week, when Mr. Alfred Gilbert, the late Mr. Harry Bates, Mr. Frampton and Mr. Drury will be among the chief artists under review.

Keystones.

The Monument of Prince Asmodeus of Savoy, ex-King of Spain, recently inaugurated at Turin, is the work of the sculptor Calandra.

Two Blocks of Residential Flats at Fulham, S.W., are about to be erected in Hurlingham Road, overlooking the polo grounds. They will have roof gardens. Messrs. Palgrave & Co., of Westminster, are the architects.

New Pavilion and Baths at Weston-super-Mare have been erected at Knightstone. The cost of the pavilion has been £21,000, £12,000 being expended on the building, £7,000 on the retaining wall and £2,000 for equipment. The baths cost £10,000.

The Excavations at Knossos which have been carried out during the last three years were practically brought to a close last week and Mr. Evans leaves for England this week. Up to the last interesting discoveries continued to be made. The whole of an ancient citadel is now completely exposed, but some minor details have still to be worked and the search for tombs will be continued next year.

The Restoration of Peterborough Cathedral has been completed, and the scaffolding has now been removed from the west front. "The finest portico in Europe," as Ruskin styled it, is once more revealed in all its beauty. The fabric has been most effectively secured, and the gables rebuilt where necessary, the old stones being used. It is eighteen years since the restoration work was commenced, and it has been carried out at a cost of £80,000.

A Burslem Competition.—Mr. W. George Laws, M.I.C.E., of Newcastle, the assessor appointed by the Burslem Town Council in the competition for designs for an isolation hospital, has selected the designs of the following architects in this order of merit:—1, Messrs. Sutcliffe & Sutcliffe, Todmorden; 2, Mr. E. C. H. Mardman, Edinburgh; 3, Mr. W. H. Walley, Burslem; 4, Mr. T. R. Longden, Burslem. Thirty-two sets were submitted. The first premium is £100 and the second £50.

The Architect and the Judge.—Mr. Justice Darling has been making some fun out of an architect who was accused of having stolen, from an old collaboration, the plot of one of the novelettes on which he spent his leisure. Giving evidence in the libel action he brought against his accuser, he complained that the person to whom the awful accusation was made had since refused to recommend him as an architect. "Not because," Mr. Justice Darling suggested, "you might steal the house, but perhaps the plot." And yet there are storeys in houses.

A Block of Residential Flats and Shops at Putney, S.W., called University Mansions, has just been completed in Lower Richmond Road, overlooking the starting-point of the Oxford and Cambridge boat-race. The property occupies a frontage to the Lower Richmond Road of 111 ft. 6 in. and to the Platt of about 97 ft. The contractors were Messrs. L. Whitehead & Co., Ltd., Clapham, and the architects Messrs. Palgrave & Co., 28, Victoria Street, S.W. The cast- and wrought-iron work was supplied by Messrs. Hawkins & Baxter, and the electric lift (with patent automatic press-button attachment) by Messrs. Child & Co. The building is fireproof throughout.

The Parish Church at Bramham, a village in the West Riding, was struck by lightning last week. The electric current seems to have entered one side of the steeple about three-fourths from its base, making a big hole. Continuing downwards it afterwards struck out at a point some feet below the fissure already mentioned, creating another and much larger gap in the steeple wall. Proceeding still further downwards, the lightning struck the top of the square tower on which the steeple rests, displacing a large number of stones and other portions of the fabric. The current then continued its course down the tower to a point near the belfry, where it inflicted an extensive bruise upon the exterior of the tower wall, giving it the appearance of having been struck by a cannon ball. It is feared that the upper portion of the steeple will become a wreck.

Springburn Public Halls, Glasgow, have been opened. They are in Keppochhill Road, near its junction with Springburn Road, and are capable of seating 1,200 and 400 persons respectively. Mr. William B. White, of St. Vincent Square, Glasgow, was the architect.

New Baths at Burnley have been erected by the Burnley Corporation in the Gannow district. The buildings contain a large plunge bath and twenty-two slipper baths. The baths have only cost the town a 4d. rate, as against a cost in some localities of 4d. or 5d.

A Peal of Bells for Luxulyan.—Mr. Silvanus Trevail, F.R.I.B.A., president of the Society of Architects, has presented a new peal of bells to Luxulyan parish church. There were originally four bells, but only two now remain intact, and these, with their framework, mountings and hangings, are in such a state of dilapidation as to be quite unusable. The new peal will consist of six bells, attuned to the old tenor bell. They will be hung and completed with all framework and fittings at Mr. Trevail's expense.

Nelson's Column, the Bank and the "Tubes."—The Office of Works intends to satisfy themselves that the Nelson Column shall not suffer any danger on account of new "Tubes," and Lord Escher has sent a note to this effect in reply to a communication from the Navy League. At the Bank there is more cause for anxiety. Sir Douglas Fox stated before the Tubes Committee that the foundations were in a bad state, the piles being rotten. A long crack was recently discovered in the bullion room.

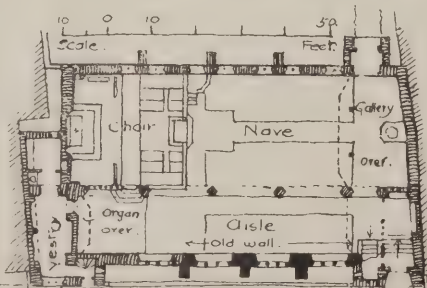
Bristol Society of Architects.—The last ordinary meeting of the session was held on May 12th. Mr. Joseph Wood, the new president, alluded with regret to the death of Major C. E. Davis, the well-known architect of Bath, who had done so much for the sister city in the development of its famous baths and the uncovering and preservation of the remains of the magnificent thermae of the Romans. Professor Beresford Pite then read his paper on "Street Architecture" (see our issue for April 16th last).

A French Law on Art.—Before the last French Parliament came to an end the Chamber quietly passed a law of much importance to French artists. Previously there was no certain legal protection for works of art such as designs and sculpture intended for industrial purposes. This defect the new law has remedied. All works of art, whether accessories to industrial objects or not, are now protected by this law, which renders only bare justice to modern art. It will give a fresh impetus to designers of ceramic ware, glass, jewellery, furniture and decorative art generally.

The Panthéon, Paris.—When the French Government decided to turn the Panthéon into a national Valhalla to honour the memory of the great men of France it was resolved to alter the interior of the building in keeping with its new character. Money accordingly was granted and artists of fame were commissioned to decorate the walls. Frescoes were painted by Puvis de Chavannes, Cabanel, Delauney, Humbart and J. P. Laurens; and Réqipon, the sculptor, was charged to execute a great monument symbolizing the altar of the "Patrie." The work is now almost finished, and when in its place in the Panthéon will stand 14 mètres high. The decorative part of the monument is in harmony with the architecture of the Panthéon.

The Baptist Schools at Histon, Cambridge, were opened recently. The schoolroom is divided up into a number of classrooms by means of several partitions, which, when thrown back, make one large hall. Two large seniors' classrooms are provided, together with infants' room, kitchen, classrooms for boys and girls, and the usual offices. The plan is of nave and aisle arrangement (the classrooms being in the aisles). Timber columns and arches carry the clearstory. The whole of the interior joinery is stained transparent green and varnished. The external facings are of red bricks, with Bath-stone dressings. The roof is covered with green slates. The heating is by hot water on the low-pressure system. The contract was let to Mr. H. Feast, of Haddenham, and amounted to £1,852. The architects for the schools and for the church adjoining (recently completed) were Messrs. George Baines, F.R.I.B.A., & R. Palmer Baines, 5, Clement's Inn, Strand, W.C.

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VIEW FROM ROAD
 PROPOSED REBUILDING, ST MICHAEL'S MANNINGTREE, ESSEX, GEO



RY LUCAS ARCHT LONDON.

Gerrard Lucas 1901.

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PEOPLE'S BATHS.*

WALTER W. THOMAS, Vice-Pres. S.A.

PEOPLE'S BATHS are seldom, if ever, heard of in connection with bathing establishments in this country. Here our public bathing establishments are termed public baths. Before America, so far as the United States was concerned, commenced to build public baths, eminent men were sent to inspect the baths throughout bathing Europe. After much time and money had been expended in gaining knowledge, the New York Association for Improving the Condition of the Poor decided to build a bath on the spray and shower system. This they did: the baths were erected in Central Market Place, and were named the People's Baths House. This appears to be the first occasion on which the term "people's baths" was used. It is now generally known to refer to public baths which are provided with spray and shower baths, but having no swimming bath.

The subject is one worthy of the consideration of architects. We all know that public bodies representing the health authorities throughout the kingdom are at present keenly interested in anything which is conducive to the health and hygiene of the people. It cannot be expected that a small parish can afford to erect baths at a cost of £10,000 or £20,000—if they did, where would the utility be? What they want is an installation of people's baths so inexpensive that such institutions are placed within the reach of all such bodies. Again, in large cities and towns already provided with bathing establishments, the judicious introduction of people's baths will supplement the existing baths and be a means of making the baths to the people. It is therefore more than probable that the next ten years will see a very rapid development of the people's baths throughout the kingdom.

Since I became a member of the Baths Committee of the Liverpool Corporation I have devoted considerable time to a study of the subject. I am of opinion that the most suitable bath for the purpose of cleansing the working classes is the spray and shower bath, and I am pleased to say that I have, together with the other members of the Baths Committee, been instrumental in introducing this type of bath into Liverpool.

It is not the intention within the limits of this paper to enter into the question of design, but to deal with the planning and details of construction, together with the engineering of people's baths.

Continental and American Examples.

Before entering into these matters it may be well to go back to the history and development of the shower and spray bath. It appears that it originated in Germany. The first establishment to attract attention was erected in the barracks of the Kaiser Franz Grenadier Regiment, of the guard in Berlin, in 1878, at the instance of Dr. Munich, a military surgeon. The bath was for the use of the officers and men. It cost £200, and was capable of bathing 300 men per hour. The bath was planned by Mr. David Grove, sanitary engineer, Berlin.

In the year 1883, at the Exposition of Hygiene in Berlin, Dr. O. Lassar exhibited a people's bath-house. It was constructed of corrugated iron without any architectural pretensions, and measured 36ft. in. long by 16ft. 5in. wide, and cost £300. It contained ten shower-bath cabins, each having a dressing-room, the usual ticket-offices, separate entrance for males and females, and administrative department. During the three months that the Exposition lasted no fewer than 10,000 persons made use of this bath. After the exhibition it was purchased by a manufacturer for the use of his workpeople. The Berlin Society for People's Baths exhibited at the Berlin Industrial Exhibition of 1896 a model of an establishment of people's baths which provided accommodation for ten persons, having five baths for each sex. This model was awarded a prize of 1,000 marks (£50) as the best plan or model of a workman's bath.

People's baths of the foregoing (Lassar-Grove) type have been constructed in many German cities. In Austria, Vienna was the first city to

establish these baths; the first was erected in 1887 and was purely experimental. So great was its success that additional baths were built, and to-day Vienna has a number of people's baths. In America people's baths have been erected in New York, Yonkers, Buffalo, Dunkirk, Boston, Brooklyn (Mass.), Philadelphia, Chicago, Newark and many other cities.

The Manchester "Tub Baths."

In England, however, no complete installation of people's baths has to my knowledge been erected, although the shower and spray bath have been introduced into existing and new public baths at Norwich, Cheltenham and Liverpool. Some years ago Manchester introduced what they termed "tub baths" into one of their establishments which was situated in one of the poorest districts. These baths consisted of a shallow circular tub having an internal diameter of 2ft. 5½in. and a depth of 9½in. They were raised above the floor and were provided with hot water, and included a warm shower bath. Beside these tub baths a range of lavatory-basins was fixed. After twelve months' trial it was found that the tub baths and lavatories were failures. It appears that the district in which these baths were situated was chiefly populated by Jews, and this would to some extent account for their non-success.

Norwich.

The Norwich baths when erected were called "stand-up baths." The bath comprises a cold shower, a lavatory basin with hot and cold water, and a footbath sunk in the floor. The arrangement of the supply to the footbath is rather novel, the water being supplied through the lavatory basin—that is, the lavatory basin waste is connected to the footbath. The idea is not at all a bad one, as one set of valves and one waste-pipe serve the two purposes. The waste plug to the footbath is actuated by means of a treadle lever. These baths have been very successful.

Cheltenham.

The borough of Cheltenham added six spray baths to their Alstone Baths in 1897. They are designed by the borough surveyor, Mr. Joseph Hall. The dressing-rooms and spray-rooms are formed in cubicles; each bathroom having two dressing-rooms, and the spray-room cubicle top-covered with glass having a ventilating sash in it; thus the glass roof prevents draughts on the bather, and also raises the temperature of the spray-room. The footbaths are raised above the floor of the room to the level of the underside of the seat, a seat being formed on the back and two ends of the bath; it slopes to the bath, which is oblong, 2ft. by 1ft. 6in., enamelled fireclay. The spray bath consists of four fine rose nozzles, two at the back and one at each side, fixed at such a height that the water strikes the bather no higher than the shoulder whilst in a sitting position. The bather controls the temperature of the water by means of screw-down valves; it appeared that there was some danger of scalding taking place. The ventilation of the bath is on the plenum system. These baths have proved a huge success.

A New System at Bristol.

Spray baths are at present being erected for the corporation of Bristol. They are constructed on Kane's system, the chief feature of which is that the dressing-rooms and the bathrooms are kept at different temperatures. Mr. Kane states that "the absence of a modern and efficient system of heating and ventilating our cleansing baths means the absence of warmth and comfort," and if the habit of bathing is to be encouraged, especially among the poorer class, where it is more required, then the better construction of bath compartments is a factor which cannot be neglected in future schemes.

On Kane's system the bath compartments are constructed so that the bathroom is separated from the dressing-room. Mr. Kane also states that he is altogether in favour of suitably-designed spray baths, but believes it to be essential that the bathroom is maintained at 100 degs. Fahr. and the dressing-room at 60 degs. Fahr. The floor-space per bath, together with the dressing-room and corridors, is 70ft. super., whilst the cubical contents per bath is nearly 1,700 ft. It is a question whether the extra cost entailed in

erecting these baths will be warranted by the additional number of persons who may make use of them, and it will be exceedingly interesting to see the result.

The Liverpool People's Baths.

The Corporation of Liverpool in the year 1892 constructed several shower and spray baths at the Charters Street Refuse-Destructor for the use of the workmen employed there. These baths have been very much appreciated by the men, and it goes to show that at works of this description—i.e., any works where the employment is of a dirty character—baths ought to be provided by the proprietor of the works to enable the workers to leave the premises in a condition fit to associate with their families. In 1900 the Corporation fitted up at their Margaret Street Baths three spray and shower baths in order to carry out experiments before proceeding to construct an establishment of people's baths. The experiments were continued for more than twelve months, and the experience gained has been utilised in the design of the Beacon Street People's Baths. The district in which these baths have been erected is in close proximity to the docks, and the establishment it is hoped will be largely used by men who are employed at the docks, and by the families of those who reside in the vicinity. The establishment stands on an area of 450 sq. yds., and cost £3,500. It comprises seventeen shower and spray baths and four ordinary slipper baths. The baths are all situate on the ground floor; there are separate entrances for males and females, with waiting-rooms, lavatories and conveniences. The baths are arranged in sections so that they may be used for males and females according to the demands of either sex. A caretaker's house and laundry are also provided, together with the engineering department.

Internal Arrangements.

The two entrances are at the extreme sides of the building, whilst the pay-office and attendants' hall is situate in the centre. Doors lead from the pay-office and attendants' hall into both waiting-rooms, and also into the caretaker's living-room and into the laundry. It may appear to many of you that the laundry ought not to be placed in the position it occupies, and that it ought to have been situate outside the baths building, or at least as far away from its present position as possible. The reason for its present position is of considerable consequence in the working of the establishment. It is the intention that the staff of the establishment shall consist of a caretaker and his wife, with the assistance of a youth. These three persons will do all the work in connection with the establishment, from the issuing of tickets, attending bathers, stoking the boiler, to the washing of towels, &c. It will thus be seen that it was absolutely necessary that the pay-office should be under observation from every room in the house, and also from the laundry, so that, however they might happen to be occupied, the attendants would command the pay-office and baths. The first floor comprises two bedrooms, cold-water tank room and store-room. In the basement are the stokehole and steam boiler, and a heating cellar in which is placed the apparatus for heating the water, &c.

Dressing-rooms.

The bath halls are top-lighted, and are heated by steam radiators and steam pipes in the roof. The baths are formed in cubicles. The division walls of the bath- and dressing-rooms are built in Shepwood enamelled bricks, with rounded angles and semicircular ends; there are no door frames or doors, so there is nothing to decay. It is the intention, instead of having doors, to provide rubber curtains between the bath- and dressing-room, and some washable material between the dressing-room and corridor. The dressing-rooms to shower and spray baths average from 3ft. 9in. by 3ft. 3in. to 4ft. 10in. by 3ft. 9in., and the bathrooms 3ft. 9in. by 3ft. 3in. to 3ft. 9in. by 4ft. Each dressing-room is provided with hat and coat hooks (these are made of galvanised cast-iron, and are built in the brickwork) and wood seat; the floor of the dressing-room is granolithic, and is sloped to the bathroom, so that it drains into the footbath; it is covered by a movable wood grating similar to those found on board ship.

* A paper read before the Society of Architects on May 22nd, 1902.

Spray and Shower-Bath Rooms.

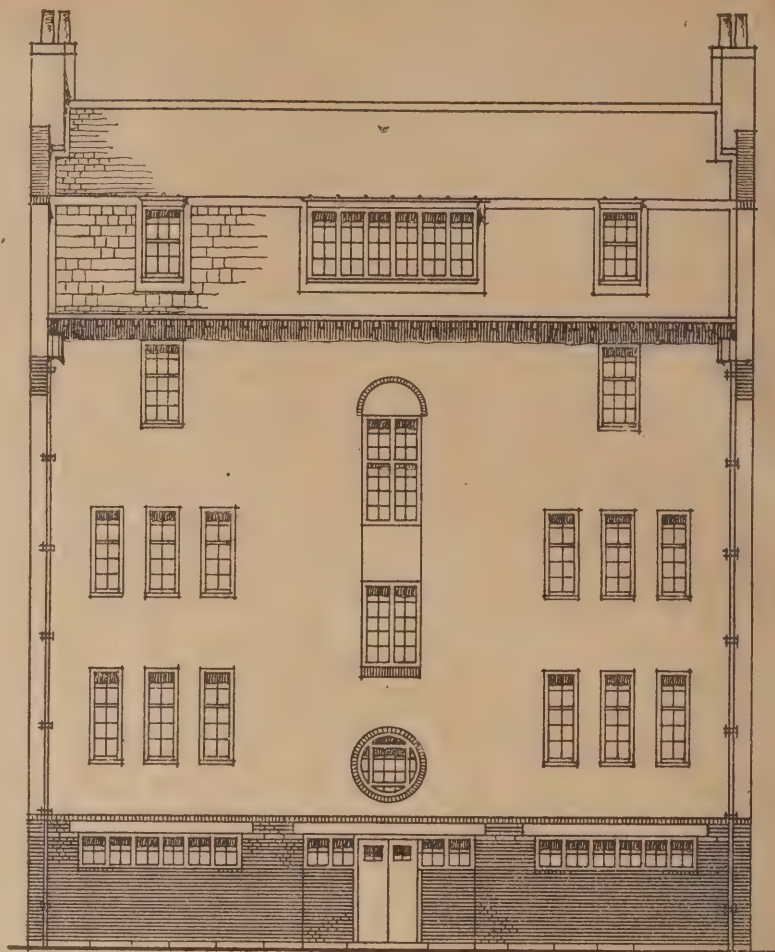
The spray and shower-bath rooms are provided with an enamelled footbath designed so that the minimum quantity of water will suffice to enable the bather to wash his feet; it is fixed in the floor so that its top edge is slightly below the level of the floor, and it is fitted with plug and chain and overflow. The spray and shower-bath are both provided with warm and cold water; the spray mantel is fixed on the wall of the bath; the shower-bath is simply a ring shower; the shower is in the form of a ring and not of a colander because the water falls in a gentle shower on to the shoulders of the bather, whilst the top of his head and his face are perfectly free from water, thereby getting over the trouble of water striking the head, obviating the consequences of shock to the system, and doing away with the difficulty in breathing generally experienced whilst under an ordinary shower-bath.

The arrangement for the manipulation of the hot and cold water is such that it deserves special mention: special valves and mixers have been designed for the purpose. The arrangement is such that when it is once set by the attendant the bather can only obtain the warm water of the temperature desired and no warmer, thus avoiding any possible chance of being scalded, whilst he can gradually cool it down until it is cold. The bather controls the valves by means of pulls, four in number, namely, warm and cold to both the spray and shower bath, and in order that he may have his hands free to wash himself with he can fix the pulls down by means of hooks on the wall of the bathroom. The soap-dish is of enamelled fireclay and is built into the wall.

Slipper Bathrooms.

The slipper bathrooms are similar to the ordinary slipper bathrooms found in public baths, and therefore require no explanation other than why they are provided. The reason for their provision is twofold—first, that as it is impossible for a person to wash a child in a shower or spray bath, some provision ought to be made to enable the parents to wash their children in an establishment of this kind, *i.e.*, this refers to children not old enough to bathe in our free open-air baths, which Liverpool was the first to introduce. And, again, slipper baths are taken on the advice of medical men as a means of curing certain ailments; therefore it was deemed necessary that such baths, to a small extent, should be included in the scheme.

Arrangements are also made for the drying of bathers' clothing during the time occupied in bathing. Thus, on a wet day, any person who has been out in the rain may, whilst bathing, have his clothing dried, and thereby be able to



PROPOSED NEW BUILDING FOR THE WESTMINSTER FEMALE REFUGE: ELEVATION TO TUFTON STREET. H. PERCY ADAMS, F.R.I.B.A., ARCHITECT.

return to his home clean in body and with dry clothing. This is an important feature, and one that ought not to be lost sight of in designing a bath of this class.

Heating and Materials.

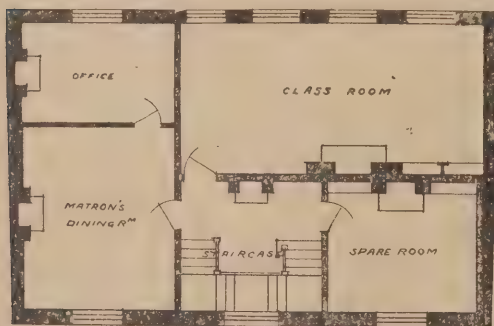
The engineering of this establishment is very simple. It consists of one Cornish boiler 8ft. by 4ft. to provide the steam for heating water, heating atmosphere and laundry requirements, and drying bathers' clothing; one

"Royle's" calorifier and storage cylinder combined, capable of heating 1,000 gals. of water per hour from 32 degs. to 132 degs. Fahr., with a storage capacity of 180 gals. The condensed steam from the calorifier and heating pipes and radiators is pumped back by means of a small donkey pump into the steam boiler. A cold-water storage tank of 1,500 gals. capacity is provided.

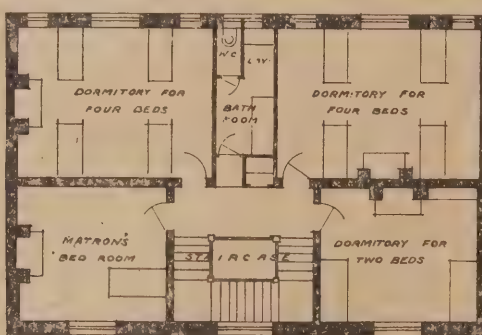
The building is constructed in brick and stone, the bath halls are faced with white enamelled bricks to the height of the baths divisions, the divisions are built with enamelled bricks 2½ in. thick (Shepwood), and the floors are granolithic. The waste water from the baths is carried away by what is almost an open channel to the outside of the building, where it passes through an interceptor into a manhole connected with the sewer by means of a syphon. The whole of the piping for water service is of lead, and the fittings are of copper and brass.

Planning.

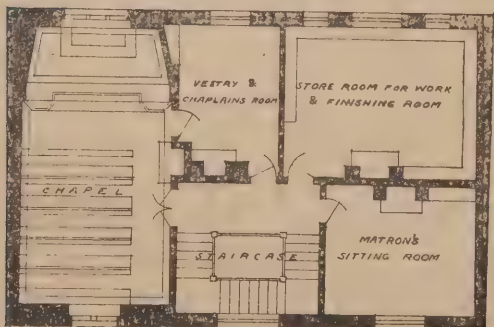
The planning of people's baths depends chiefly on the shape of the site available, but as the hall and rooms required may be of any form no unsurmountable difficulties will be experienced with any ordinary site; care, however, ought to be taken to have the arrangements as symmetrical as possible. It is advisable that there should be two entrances, one for either sex, leading into a waiting hall, from which access to the baths is obtained. The bath hall ought to be in sections or blocks, so arranged that they may be used for males or females as required. Should there be ample room at disposal, the size of the dressing-rooms would not be too large if made 4ft. by 4ft. 6in., and the bathrooms could be the same size. The minimum size of either rooms should not be less than 3ft. 6in. by 3ft. 3in. The corridors may be from 4ft. to 6ft. wide; 5ft. is a fairly good width if the corridor is not more than 30ft. long.



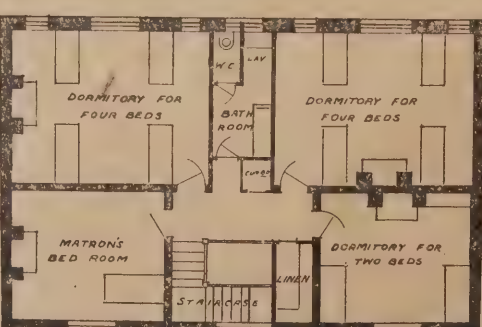
FIRST-FLOOR PLAN.



THIRD-FLOOR PLAN.



SECOND-FLOOR PLAN.



FOURTH-FLOOR PLAN.

The engineering requirements are not extensive and may be of several descriptions. The crux of the question is an adequate supply of hot and cold water. The hot water may be obtained by heating cold water with steam in a calorifier from a steam boiler, or by the household or greenhouse circulating system; if either of the latter systems is adopted, provision must be made in the laundry for boiling towels.

Materials.

The question of deciding what materials to use in the construction of baths is undoubtedly one that gives architects and engineers considerable food for thought, not so much from want of knowledge of suitable materials, but from the troublesome question of cost. Public bodies require buildings good and substantial, yet when their architect or engineer suggests that for a public bath iron ought to take the place of wood, and enamelled bricks or even marble ought to take the place of plaster or ordinary brickwork, and that all pipes ought to be either copper or lead, and so on, then they begin to think their adviser is extravagant or even ambitious. It is not so, however; the best and most suitable materials are the cheapest in the end. Buildings ought to be constructed so that the annual charge for the maintenance of the fabric is reduced to the minimum; at the same time the materials shall be such that they give to the establishment an air of cleanliness and comfort. No public building should be erected that will not last at least thirty years (the term for which a loan is granted) without unnecessary cost to the ratepayers.

Vital Considerations.

The following are the three chief advantages of the spray and shower bath as a bath for the people:—(1) The best medium for cleansing the body; (2) provides for the comfort of the bather; (3) the economics of the system. With regard to the first point, undoubtedly the best means of thoroughly cleansing the body is by means of a Turkish bath; not only is the surface of the skin cleansed, but the whole of the pores of the skin are cleansed and the body is left in a condition much to be desired. In considering the best means for our purpose we must consider the class of people we have to cater for, and the nature of their employment. When we consider this, we can only arrive at one conclusion, and that is—we have to cater for a class who have to earn their bread by the sweat of their brow; only the very small minority live sedentary lives; consequently the question of cleansing the pores of the skin as cleansed by the Turkish bath may be left out of the question—perspiration during their labour keeps the pores of their skin in order. What we have to do is to cleanse the surface of the skin. That being so the spray and shower bath is the best medium.

In comparison to the slipper bath the shower and spray bath is by far the more economical. Given both a dressing-room and bathroom, it occupies only half the floor space of an ordinary slipper bathroom, so that the building cost per spray and shower bath is considerably less than per ordinary slipper bath. The cost of maintenance is also very much reduced. The ordinary slipper bath consumes on an average 50 to 60 gals. of water, not including the shower, where one is attached. The shower and spray bath, even when most lavishly used, does not consume more than 10 gals. of water; moreover the cost of fuel for heating must be five times greater for ordinary slipper baths than it is for shower and spray baths. The number of attendants required to work the baths is in favour of the shower and spray baths, as there are no baths to be filled, and, what is of the greatest importance, there is not the slightest possibility of drowning taking place, certainly not accidentally; and even if a bather wished to commit suicide he would have the greatest difficulty in doing so.

One shower and spray bath will do the work of at least two slipper baths, the time occupied in taking the shower and spray bath being half the time occupied in taking a slipper bath; in most cases it will be found that the proportion will work out at 3 to 1.

If the baths now built become popular with the working classes, I hope that before long the Corporation of Liverpool will erect others at

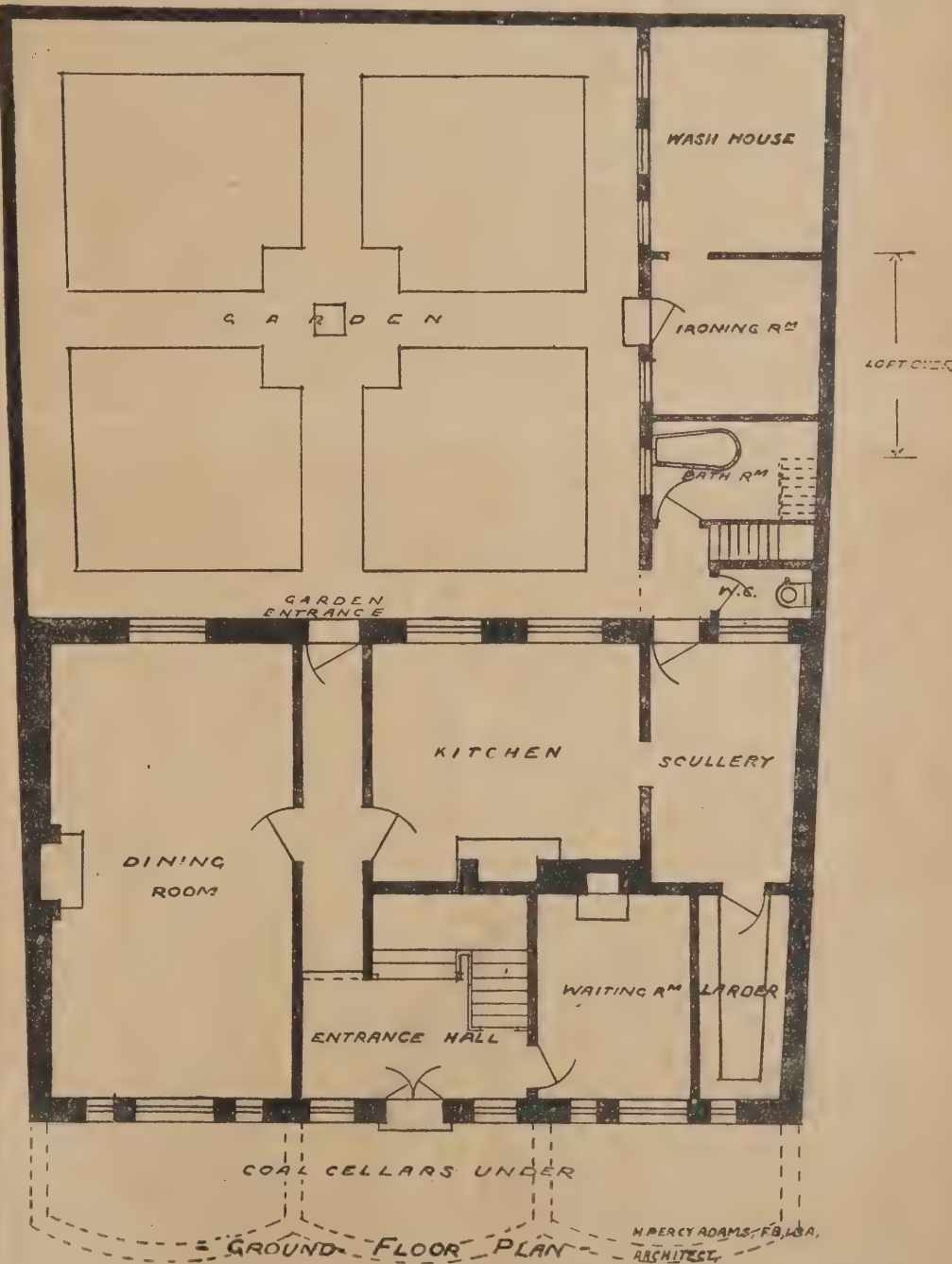
distances of about a quarter to half a mile along the entire system of their seven miles of docks, the entire cost of which would not exceed the cost of one of their existing large public baths, which averages from £20,000 to £30,000.

WESTMINSTER FEMALE REFUGE.

FOR forty-six years the Westminster Female Refuge has been carried on at 14, Great College Street, S.W. It is now proposed to build a new refuge on a site in Tufton Street, which the committee of the institution has secured from the Ecclesiastical Commissioners on a lease for 999 years. The designs have been prepared by Mr. H. Percy Adams, F.R.I.B.A. As will be seen from the accompanying plans, the ground floor is to consist mainly of the dining-room and offices, with a good piece of garden at the back; on the first floor will be the matron's dining-room, an office, a spare room and spacious classroom; the feature of the second floor will be the chapel; whilst on the third and fourth floors will be the sleeping apartments. An appeal is now being made for £3,000 towards the new building. Contributions should be sent to John Charles Thynne, Esq., Little Cloisters, Westminster Abbey.

Law Cases.

Workmen's Compensation: Judges at Variance.—*Cooper & Crane v. Wright.*—This case recently came before the House of Lords. It was an appeal from an order of the Court of Appeal reversing an order of a county-court judge. The appellants are builders in Nottingham, and the respondent a slater and tiler. In 1900 a man called Brady was employed by the respondent as a slater's labourer on a building in Angle Row, Nottingham, which was being constructed by means of scaffolding. The appellants were engaged in the construction, and they employed the respondent to do the slating of the roof. Brady was fatally injured by the collapsing of a hoist for raising the slates. The widow of deceased sought compensation from the respondent under the Workmen's Compensation Act, 1897. The respondent said he was not the "undertaker" of any work under the Act. The county-court judge ordered the appellants to pay £217 to the deceased's widow, but held that the appellants were entitled to be indemnified by the respondent. On appeal the Court of Appeal held that Cooper & Crane were not entitled to an indemnity for what they had to pay to the widow; also that they were the "undertakers," and Wright was a sub-contractor. The



PROPOSED NEW BUILDING FOR THE WESTMINSTER FEMALE REFUGE.

appellants then came to the House of Lords. The Lord Chancellor, Lord Shand and Lord Davey were of opinion that the decision of the Court of Appeal against the indemnity was wrong, Lords Brampton and Robertson that it was right. The result was that the appeal was allowed by a majority of their lordships. The judgment of the county-court judge was accordingly restored.

A Sequel to a Lock-out.—A case of considerable importance to employers of labour and trade-unionists was recently heard before his Honour Judge Coventry at a special sitting of the Blackpool County Court. It was brought by a joiner named Balcock against the St. Anne's Master-Builders Federation, with their chairman, secretary and a member of the committee, for having practically conspired to persuade a firm of builders by whom the plaintiff was employed to break their contract with him on account of his action in regard to a lock-out which took place. In giving judgment his Honour said he did not think there was evidence enough on which to find a verdict for plaintiff. There was no evidence to show that there was any hostile feeling between the secretary of the Masters' Federation and the secretary of the Men's Union; still less was there evidence of any feeling between the association and the man. It seemed to him that the obvious reason why the man was picked out was that he was the secretary for the men, and they were simply carrying out their own rules with the object of getting the strike ended as soon as they could. He could not find evidence that the dismissal was secured with the intention of injuring the man, and he found for the defendants.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Design.

LONDON, E.C.—N.S. writes: "In what book can I find instruction relating to all styles of designing (especially wallpaper)?"

See Walter Crane's "Bases of Design" (George Bell & Sons, price 6s. nett), and the section "Paperhanger" in "Specification No. 5" (published at these offices, price 5s. nett), corrected by Mr. Walter Crane.

Colouring for Pipes.

LIVERPOOL.—D. H. W. writes: "What is the correct colouring for different pipes connected with drainage?"

Sewage pipes should be coloured red, and rain- and surface-water pipes blue.

Mediæval Watch-Tower on the Propylæa, Athens.

NEWCASTLE writes: Kindly give some information about the square tower on the south side of the Propylæa at Athens at the side of the tower of victory (shown on photographs, c. 1865). When was it built and when taken down, as modern photographs do not show it?"

The mediæval watch-tower which once occupied the south wing of the Propylæa is generally assigned to the time of the Burgundian dukes of Athens, but it can only be said with certainty that the date of its erection is not later than the fifteenth century. The tower was taken down in 1874 by the Greek Archaeological Society, with funds supplied by Dr. Schliemann. During its removal many stones belonging to the south wing of the Propylæa were found embedded in the walls, and these we believe have been restored to their original positions. J. A. M.

Agreements with Corporate Bodies.

RAMSEY, I.M.—J. J. B. writes: "I am doing some work for a corporate board, and I wish to have a proper agreement with them. The whole board go out of office in October next, before my work will be completed, and a completely new board will be elected, who may repudiate the doings of their predecessors if agreements are

not under seal. When can such an agreement be procured?"

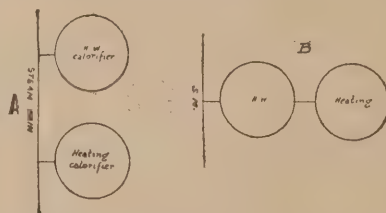
As English law frequently does not apply to the Isle of Man, it would be not only wisest but essential that a local solicitor should be consulted, and the agreement drawn up by him; while useful information might be obtained from Macey's "Conditions of Contract."

G. A. T. M.

Steam Heating Apparatus.

LIVERPOOL.—LOCOMOTION writes: "In a hot-water heating system with steam calorifiers for a series of isolated blocks, instead of making a separate steam-supply connection to the heating and hot-water supply calorifiers, as at A, would it be practicable to so connect the two calorifiers that the exhaust steam from the hot-water supply calorifier would pass to and heat the water in the heating calorifier, as at B, and if so would there be any saving in the steam consumption? The hot-water supply calorifier is placed first so as to receive the full benefit of the live steam; the heating calorifier could be cut off in summer weather, and the other only worked. The condense would of course be returned to hot well or drain."

To supply the calorifiers separately as at A on querist's sketch is much better than the arrangement shown at B. The latter is so undesirable that it may fairly be termed impracticable. With proper regulators on the calorifiers there should be very little exhaust steam to do anything with. It would therefore mean forcing all the steam used in the heating calorifier through the hot-water calorifier. No appreciable saving would



result. But by connecting as at B, there is the great disadvantage that the regulation of the heating of water in the heating calorifier is partially lost control of. It depends on the pressure of steam in the mains and the amount of work the radiators have to do. But it also depends on the amount of water drawn from the hot-water supply: for if a large quantity of hot water be drawn the cold water which replaces it will require a large quantity of steam until it also is heated, and while the temperature of the cold water is being raised the heating calorifier would receive very little steam, and in cold weather the temperature of the water in the radiators would be materially reduced through a run on the hot-water supply. G. A. ALLAN.

Value of Architect's and Surveyor's Practice.

ONE WHO IS ABOUT TO PURCHASE writes: "What amount should be given for the purchase of an architect's and surveyor's practice established twenty-five years, exclusive of the value of the office fixtures, drawings, pictures, &c.? The average income for the last five years has been taken at £1,000 per annum nett. There are no appointments, but the work is general and varied. If a partnership, what would be the value of one-half share, and of a third share only?"

This is a most difficult question to answer satisfactorily. It ought in any individual case to be submitted to an arbitrator agreed upon by both parties, he being allowed access to the books, and being given every information as to the nature of the practice and the restrictions to which the vendor is willing to submit and the introduction which he will give to the purchaser. Some practices are so entirely personal that they have no selling value—others so scattered that no restriction as to distance within which the vendor may open an office will prevent his old clients from following him. In any case when purchasing an entire business it is to be expected that a considerable part of the existing clientèle will be lost, there being nothing to restrain clients from going to known competitors rather than to an unknown suc-

cessor. Two years' purchase is consequently the utmost value, as a rule, where there are no appointments transferable, while three years' purchase would not be an extravagant price for a fairly certain half-share, this again diminishing as the share is reduced towards little more than an assistant's salary. In all these cases there is needed care to ascertain that the average value of past years has not depended much on some one large contract recently completed.

G. A. T. M.

Reciprocal Diagrams for Roof-Trusses.

MORPETH.—L. A. L. writes: "Kindly give the reciprocal diagram for an iron roof of the accompanying design (not reproduced)."

Similar enquiries have been answered from time to time, and we must refer our correspondent to p. 442 of our issue for July 18th, 1900, and to pp. 202 and 220 respectively of our issues for October 30th and November 6th, 1901, for information which will enable him to work out the diagram for himself.

Lighting for Country Mansion.

LONDON, S.W.—W. F. R. writes: "Is there any satisfactory illuminant, other than electric light or acetylene, suitable for a country mansion?"

We would suggest the Kitson system of lighting, consisting of incandescent mantles used with oil lamps. Particulars can be obtained from the Kitson Lighting Company of Great Britain, Ltd., 1, Victoria Embankment, E.C.

Storage Water Tanks.

UPPER CLAPTON.—W. J. writes: "Kindly recommend a good work on large storage water cisterns."

There are some notes on water tanks in Matheson's "Aid Book to Engineering Enterprise" and Tudsbury and Brightmore's "Principles of Waterworks Engineering." Both are published by Messrs. E. & F. N. Spon, Ltd. We know of no book dealing specially with the subject.

Architect and Client.

QUERIST writes: "I designed and am superintending the erection of a house and stables, &c., costing about £1,500, for which I agreed to charge 5 per cent. and 2 per cent. for quantities. The house is more than half finished and my client expresses himself perfectly satisfied with it. I received a cheque for £40 and sent an ordinary receipt for it: but much to my surprise I received a letter from a solicitor whom my client had instructed stating that it must be clearly understood there was no liability to pay anything more than the 7 per cent., and requesting the drawings, quantities, &c., to be sent to his client. I naturally objected to this. In the contract it is provided that the woodwork shall be given one coat of priming only, my client intending to obtain further estimates for the other three coats and also an estimate for gates, &c. This work I now refuse to have anything to do with. Am I justified? My client has been very troublesome from the beginning; he has written me nearly 100 letters, required alterations, asked me to meet a water diviner, &c."

We think there has been considerable want of tact shown on both sides. There is no cause for dispute in the present matter and no good will come from it. The form of receipt you gave is quite in order, but if the client wishes it we cannot see why a statement should not be made in it that it is on account of 7 per cent. on the cost of the work. You are entitled to refuse to give up the contract drawings and specifications, which are your property, but facility should be afforded the client to consult them at your office. You are also entitled to refuse to do any further work for him, but we consider it would be only right that you should superintend, &c., the extra painting works, &c., which will of course be paid for by commission on the cost. As regards your client's fussiness, this is only what is to be expected, but the rough has to be taken with the smooth. Tact will generally make things easy, but if an architect does not like the way things are going he should throw up his commission early.

Correspondence.

Building Construction: Books and Practice.

To the Editor of THE BUILDERS' JOURNAL.
BIRMINGHAM.

SIR,—I should be exceedingly obliged if you would inform me of a Building Construction book (Advanced) which meets with the requirements of the South Kensington examination in this subject. "Rivington's Advanced" and "Mitchell's Advanced" are absolutely inadequate. As to several of the questions set in this last examination, it is impossible to find the correct answer.—Yours truly,
S. N. C.

[Our correspondent will find the Advanced questions answered in our issue for May 14th. There was a change of syllabus last year. We saw that some special guidance was needed in preparation for the examinations, and we gave a number of lessons which students who followed them will have no doubt found useful, particularly in stress-diagram drawing and the quantitative dealing with common materials. These matters are specially important in the papers. But the student must get away from the idea that he is to learn building construction from books as a process of question and answer like a catechism. One of the most successful teachers we have known said that for the teacher to ask questions is the wrong ideal: good teaching induces the student to ask questions. The very commonest things necessary for the practical builder to know are not even mentioned in books on building construction. For example, ladders. It may be said that working with a ladder is a workman's business, but the safe working with ladders is of the highest importance. Leaving to books on mechanics nice questions of fanciful reactions of ladders against walls, a ladder resting on the top edge of a parapet or window-sill, and projecting above it, is less liable to slip than a ladder whose top bears against a vertical wall, &c. How are ladders made, and of what materials, &c.? The most valuable source of information on building construction is the actual work to be seen going on around us. The student is invited by the syllabus "to lose no opportunity to see works in progress"; let him observe what is going on, and let him fearlessly quote what he has seen: it may be not the best way, but if he makes it clear that he has seen the thing done, a common-sense examiner is bound to give credit for whatever common-sense the answer shows. It is hopeless to get a thorough knowledge of building from books, together with two or three hours a week teaching. Books are good, teaching is good, but they are only good in conjunction with actual observation. The only way in which an examiner can make the recommendation "to see works in construction" more than a piece of pious advice is to make it "pay" in his examinations. There is much room for improvement in the books, but they can never be made to cover the whole of the ground. We have done something to "give a lead" with our lessons. In preparing the solutions which we have given a practical man has written down, with a little consultation with books as possible, practical answers. These answers may be quibbled over: it may be said that they are not the best possible solutions: let it be remembered that the best possible is never attained in practice. It is useful to remember that there is no such thing as an elementary question: what a student knows about a question, if he knows anything and writes it down, is his elementary answer. There was an elementary answer to the famous question "Why does an apple fall?" before Newton's time, and there is not yet a complete answer to that question.—Ed. B. J.]

In the answer to question 32, Advanced Stage (see p. 202 of our issue for May 14th), the bending moment was given as 761'75. This of course should be 779'75.

The Great Hall of Taunton Castle has recently been thoroughly restored, and is now a museum. The first castle on the site was erected about the year 700, and the great hall, which has been restored, was the scene of the "Bloody Assize" held there by Judge Jeffreys.

SOUTH KENSINGTON EXAMINATIONS.

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—HONOURS: Part I.

[The questions and answers in the Elementary Stage were published in our issue for May 7th last, and those in the Advanced Stage in our issue for May 14th. Of the paper now given it was not permissible to answer more than six questions, one at least to be selected from each of the first two divisions and two from the last.]

DIVISION I.

41. DESCRIBE the complete operation of brick-making. Candidates who have experience of the actual operation should answer from their direct observation as far as possible. (45)

Good building bricks are made from very different "clays." The mode of making depends very much upon the demand; for small local demand simple hand-working methods are used; where suitable clay, &c., are abundant, the demand great and means of distribution good, elaborate machinery is used and the bricks are burnt in continuous burning kilns.

The locality in which I have seen brick-making is fortunate in having a natural material well proportioned to make good bright red hard bricks. The geological formation is Trias: the rock may be described as a clayey sandstone which softens to a mud when exposed to the weather. There is chalk in the neighbourhood, which is available to grind and mix with the "clay." The material is free from pebbles. The bricks are now mostly made in a large way by machinery, but there are still some clamp-burnt bricks made by hand. The clay mixture (chalk-breeze and "clay") is weathered, dug over in layers, and wetted; it is next passed through a pug mill and brought to the proper consistency for moulding. The mould is formed by the sides and ends of a box of the shape of a brick, but of a size to allow for shrinkage in drying and burning: it has neither bottom nor top: the moulder wets it to facilitate lifting it off the moulded brick. The mould is laid on the table, a lump of clay is dashed into it and pressed to fit it; the surplus clay is cleaned off. A boy carries off the moulds and their contents to the hack. The hack-floor is prepared level and sanded; on this the first green bricks are laid, the

moulds are lifted off and returned to the moulder. The course of green bricks when somewhat firm is sprinkled with a thin layer of sand and a fresh course laid upon it. When the green or raw bricks are partially dry, they are rearranged on the hacks, wider spaces are left between the bricks, and the hacks are built higher. The hacks (walls of unburnt bricks about 4ft. high) are covered in wet weather with light frames thatched with straw. When the bricks are sufficiently sun- and air-dried they are built into clamps for burning.

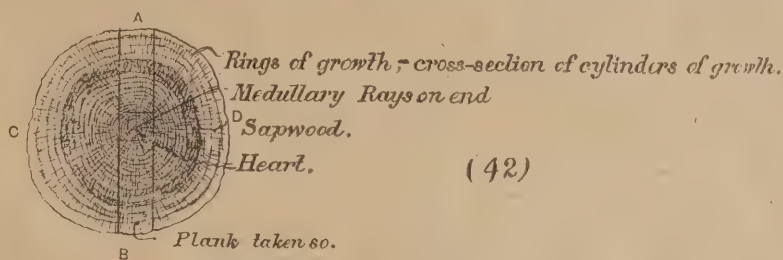
A clamp is a rectangular, carefully-built heap of bricks with the lower courses open and having layers of breeze in the lower beds; there are wider openings—fire (live) holes—in the bottom courses at which fire is applied to burn the clamp. The outside is formed with inferior old bricks and plastered with clay. Fire is applied at the fire-holes, the breeze burns, the whole mass heats and remains hot for several weeks till the bricks are burnt, the outer skin is removed and the bricks are taken away as they cool.

*42. A portion of the trunk of an oak. Draw a cross-section (the clean freshly-sawn and smoothed end of the trunk polished if necessary). Show such markings as you think deserve notice and description. Suppose that the tree is sawn longitudinally on the line A B, and that the sawn face is polished, sketch such markings as will appear (what a house-painter imitates in grain-ing). Show the markings when the cut is on the line C D. Identify the various portions of structure which present different appearances in the three sections. Show how you would take a plank that would be least affected in its breadth by shrinkage in seasoning. (45)

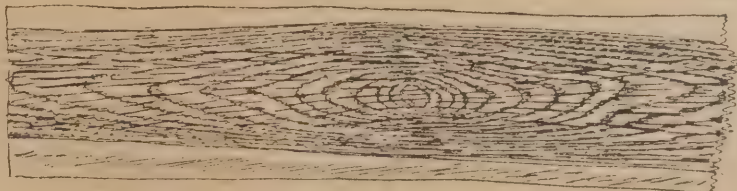
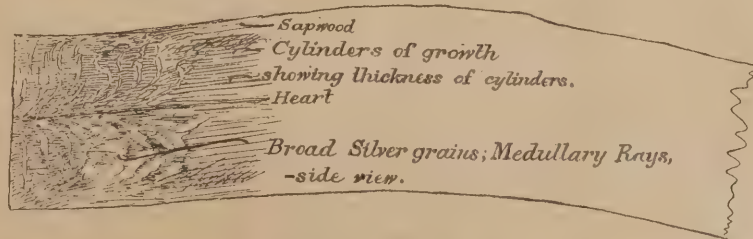
(See accompanying illustrations.)

43. Describe the quarrying of a good building stone. Give the geological formation to which it belongs, or name the quarry and give the general character of the stone. Sketch and describe the tools used. If the candidate has had opportunity to see actual quarrying, he should endeavour to describe what he has seen. (45)

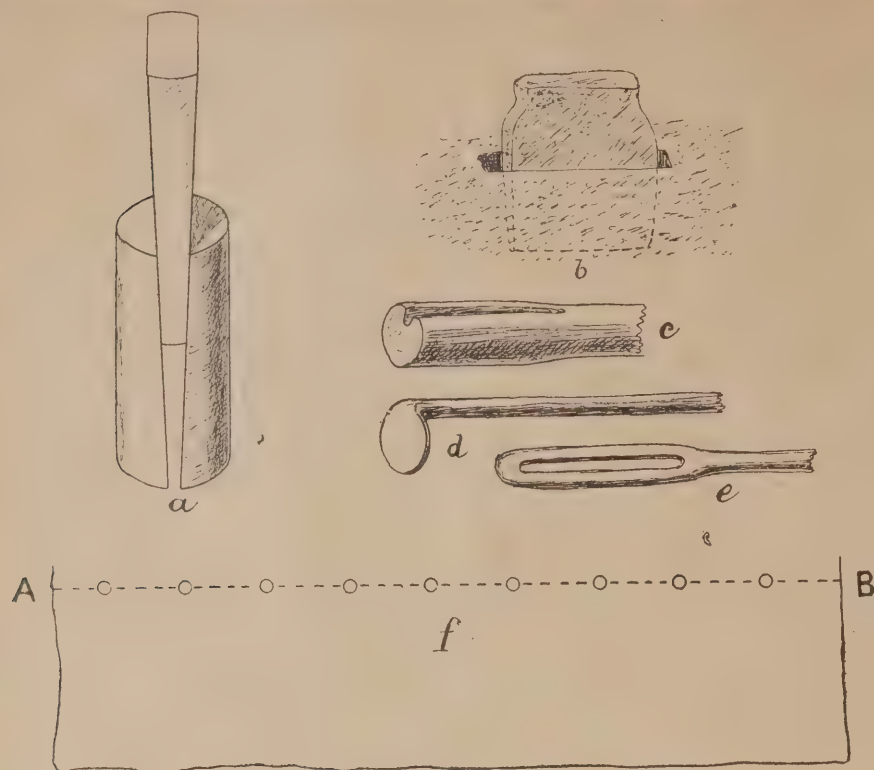
The cutting of rock in tunnelling or in open railway cuttings, &c., is a different operation from "quarrying"; the purpose is different. For quarrying the purpose is to get the stone of the proper size and shape for building; but the clearing away of material so as to be able to reach the building stone is often a necessary



(42)



Cylinders of growth intersected by a plane.
The bend in the tree (&c.) easily accounts for appearance.
Longitudinal streaks show Medullary Rays, on edge.
Solution to Question 42.



Solution to Question 43.

part of quarrying. For such purposes blasting powder and other explosives will be found to be useful. Blasting powder is also useful for breaking up rocks into convenient fragments for rough walling. For blasting purposes holes are "jumped" or "drilled" by means of steel jumpers (or drills). A charge of blasting powder is placed in the bottom of a hole; a Bickford fuze is pushed down the hole to the powder; the hole is filled with tamping, and the fuze is cut to the proper length and fired. Good stones are broken off by drilling holes in a straight line and breaking the block along this line by plugs and feathers; or slots about 3 in. long, 1 in. wide and 3 in. deep may be cut, and wedges driven in so as to fracture the stone along the line. This latter method is common for quarrying blocks of mountain limestone, with the working of which I am familiar. Plugs and feathers in round holes are useful for getting granite blocks. The tools used in a large well-worked quarry are very various. Stones are sometimes cut out by continuous wire bands worked by a steam engine. I have seen work of this kind. Cranes may be large and powerful. Pumping machinery is often needed to keep the deeper parts of the quarry free from water. (For some simple quarrying tools see accompanying illustrations.) *a*, Plug and feathers for round holes in granite; *b*, wedge for rectangular holes in mountain limestone (or other stones for which this mode is suitable); *c*, end of tamping bar; *d*, one end of scraper; *e*, other end of scraper; *f* shows a row of holes drilled to provide for the breaking off of a piece of granite along the line A B, using plugs and feathers in the holes.

DIVISION II.

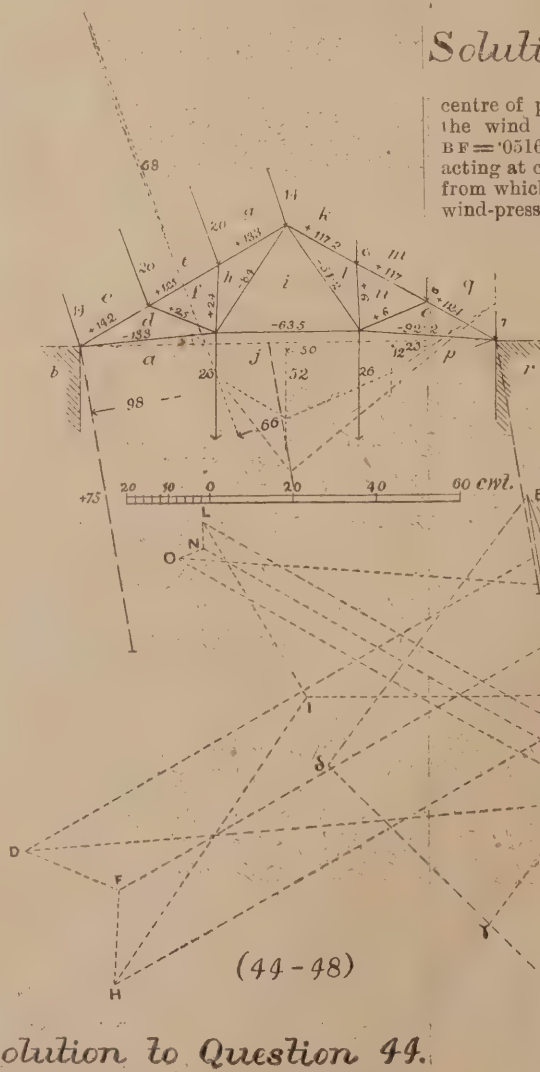
*44. Determine graphically the stresses in the roof-truss shown. Mark the amount of the stress in each member, on the member, and show compression by the sign + and tension by the sign -.

(See accompanying illustration.)

Note.—The drawing shows two ways of obtaining the reactions on the walls; it would, of course, be sufficient for the student to show one way. The reactions on the walls are taken as being parallel—as being the simplest assumption to deal with. When the truss rests in stirrups the reactions may be taken to be parallel; when it rests directly on the walls the reactions are indeterminate, because if one wall yields to the horizontal force the other wall then has more to do. Dealing with a roof-truss in this way is only

part of the whole question of the roof concerned.

The loads 14, 20, 20 and 14 are replaced by



(44-48)

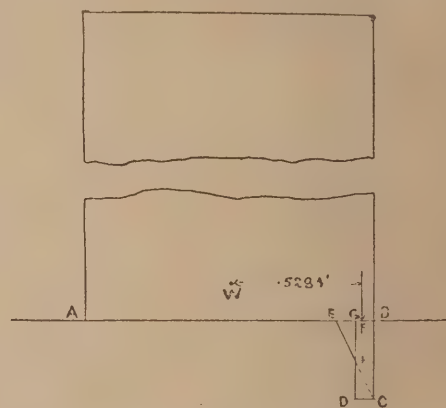
Solution to Question 44.

the load 68; 26 and 26 by 52; 6 and 6 by 12. Take moments about the bearing point on the right wall (the figures 98, 66, &c., are got by using the scale of forces temporarily as a scale of distances). Proceeding by the "polar" and "funicular" method, the work is also simplified by compounding the loads as shown. This question tests the student's expertness in routine stress-drawing.

45. A brick wall is 10 ft. high; it is 13 in. thick; it may be taken as resting, without adhesion, on a horizontal bed at the ground level, and on which it bears uniformly. Assuming its weight to be 120 lbs. per cub. ft., and that its safe load (for crushing) is 8 tons per sq. ft., what wind-pressure per sq. ft. will it safely bear? Sketch a vertical cross-section and show the centre of pressure on the bed which will accord with the assumption of a maximum pressure of 8 tons per sq. ft. (51)

(See accompanying illustration.)

The wall weighs 62 tons per ft. run, and at 8 tons per sq. ft. a breadth of .0775 ft. would carry it. Make $GB = .0775$ ft., draw BC to represent 8 tons to any scale, bisect GD in H , draw CH , take BF equal to $\frac{1}{2}$ of BE ; F is the



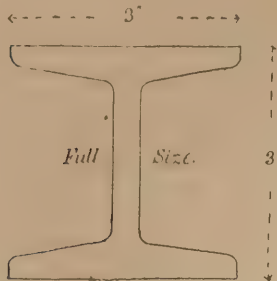
Solution to Question 45.

centre of pressure when the wall is laid over by the wind in the conditions of the question. $BF = .0516$ ft. Weight of 1 ft. run of wall, 1,400 lbs., acting at centre of wall. $1,400 \times .5284 = 5 \times 10x$, from which $x = 14.79$, or say 15 lbs. per sq. ft. of wind-pressure.

Note.—If the wall is pressed over by the wind to such an extent that there is a pressure of 8 tons per sq. ft. at B, the breadth EB will carry it, having the pressure nought at E; that is, there will be no pressure from A to E, and the joint will gape at E; strain is proportional to stress.

46. What is the weight per ft. run of the mild steel joist shown (approximately)? The

(46)



formula $D = \frac{5WL^3}{384EI}$ gives the deflection of a beam under a load. For this formula to apply, in what way is the beam supported, and how is it loaded? What do the letters E and I represent? (45)

a. The area of this section is 2.9 sq. in. (a square inch of iron 3ft. long weighs 10lbs.); this joist is therefore 29lbs. per yd. or 2 1/3 lbs. per ft. (probably intended to be 10lbs. per ft.).

b. The beam is supported at each end, and it is uniformly loaded from end to end.

c. E is Young's modulus of elasticity and I is the moment of inertia of the cross-section about the neutral axis.

DIVISION III.

47. A railway is carried over a common road on a masonry arch; the centre line of the railway makes an angle of 60 degs. with the centre line of the road; the width of the road is 24ft.; the arch is segmental (at right angles to the centre line of the road), having a rise of 9ft. Draw the half elevation of one face, showing the obtuse angle of an abutment, and showing the joints in the half ring. In what respects do these ring joints differ from the ring joints of a direct elliptical arch when they are drawn as normals to the intrados curve? Show how you draw normals to an ellipse. Describe what you understand by a coursing helix in the sheeting of a skew arch. (51)

(See accompanying illustrations.)

The figure over the elevation is a half plan of the intrados, having parallel lines marked upon it 3ft. apart. The curve A C is the development of the curve where the face meets the intrados. C D, D E, &c., are equal spaces (the final space being a half space for the keystone): from these are found the intrados edges of the ring stones. The joints are not really straight lines; they are curves of intersection of the plane of the face with twisted surfaces (the coursing helices): in the drawing they are straight lines radiating from O, the point where the axis of the bridge cylinder meets the plane of the face.

F G H being a quarter of an ellipse, to draw a normal at G; draw the quadrant F G' I, draw N G G' at right angles to P F O, draw P G' tangent at G', the line P G is tangent at G, and G T at right angles is a normal at G: or bisect the angle between lines to the foci.

A coursing helix is the bed joint between two courses. It may be supposed to be generated by a straight line directed constantly to the axis of the bridge cylinder at right angles to it, and having its extremities constantly, one in the intrados and one in the extrados. If we confine

our attention to the point in the intrados, its motion at any instant is compounded of two motions—one parallel to the axis of the bridge cylinder and the other in a circle whose plane is at right angles to the axis. The curve A B on the drawing is a horizontal projection of its path, assuming for the case in hand that the velocity in the circle: the velocity parallel to the axis :: 1 : $\sqrt{3}$.

*48. Design the truss shown. Sketch sections of its parts and the different joints to the scale of 1/8". What is the weight of the truss? (51)

(See accompanying illustrations)
26ft., say 9yds. of 1 1/2 in. by 1 1/2 in. by 1/4, say 100lbs.
96ft., say 32yds. of 2 in. by 2 in. by 1/2 in. " 320 "
26yds. 1 1/2 in. by 1/2 in. " 195 "
19yds. 2 in. by 1/2 in. " 190 "
Add for pins, &c. " 160 "

905lbs.

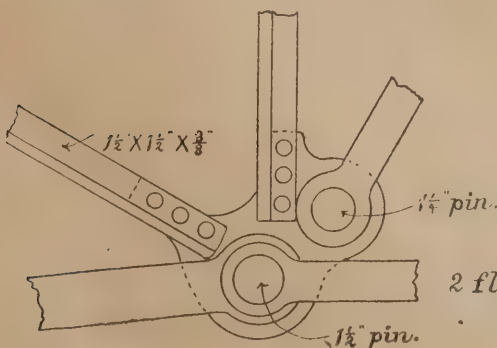
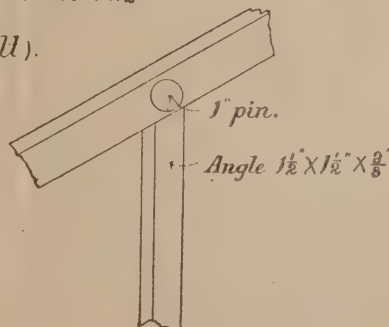
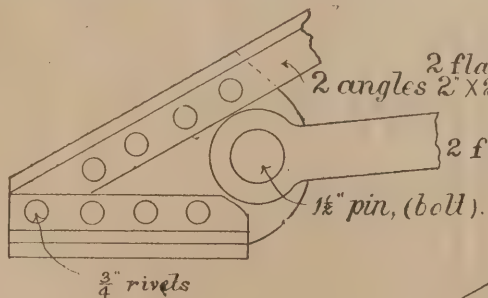
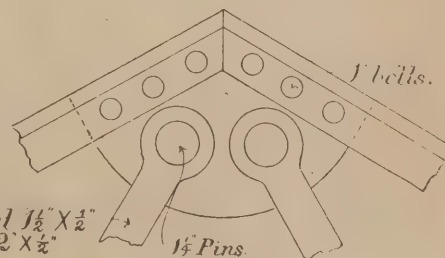
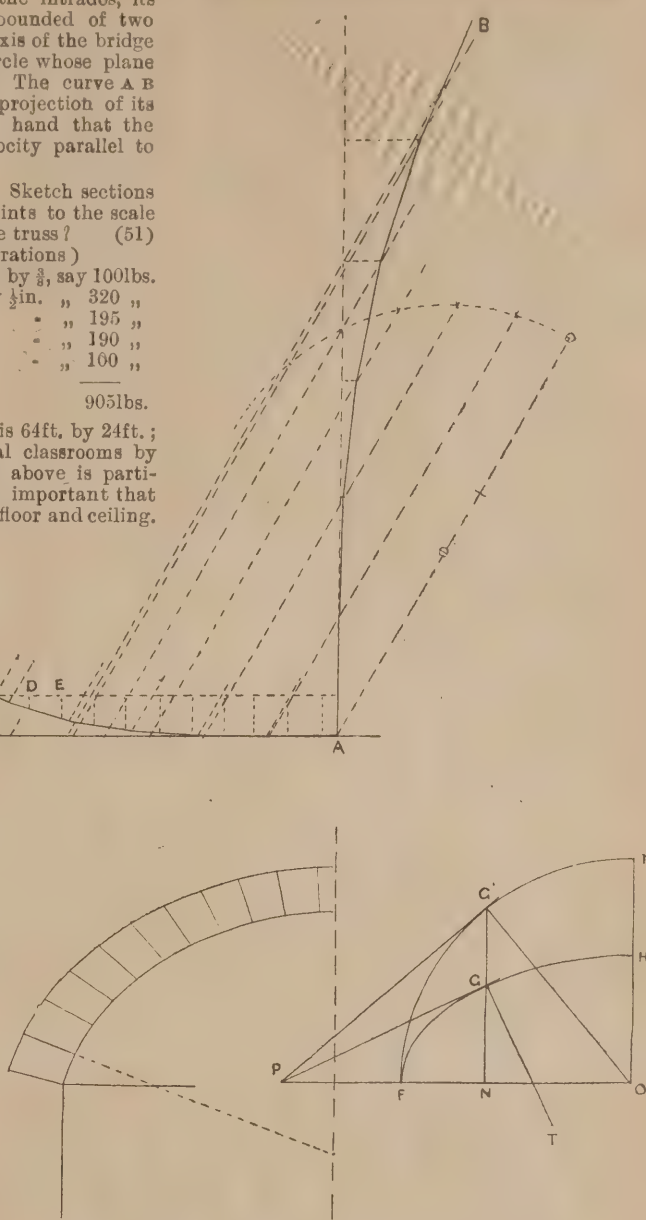
49. A hall in a girls' school is 64ft. by 24ft.; it is divided into three equal classrooms by movable partitions. The floor above is partitioned into music-rooms: it is important that no sound shall pass through the floor and ceiling. The floor and ceiling are

carried on rolled joists, which lie across the 24ft. span, and these are managed so as to show below the ceiling as little as possible. No timber enters any wall. Give such sketches and explanations as would fairly direct an intelligent foreman to have this floor and ceiling properly and sufficiently constructed. (51)

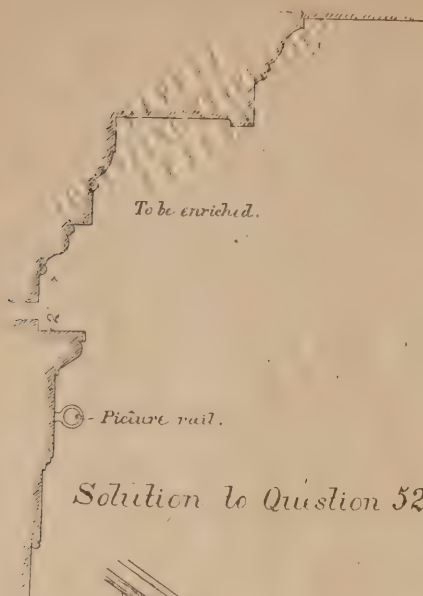
(See illustrations on next page.)

The plan shows the positions of the girders which have been built in the walls in the proper positions. The joists run from girder to girder, and at the end walls they rest in sleepers which lie close to the walls and bear upon 1-irons which have been built in. (Iron is fairly safe from rust when surrounded by Portland cement.) When a rolled joist is built into a wall in a block of cement masonry or concrete, it may be made to bear both on the top and bottom flange, and it is probably better without a template in the ordinary meaning of the word. The girders (joists) A A are arranged to carry the folding partitions. The sketch B shows the flooring joists and ceiling joists meeting at a girder, and it is fairly clear. The sketch C shows flooring joists (9in. by 2in.) tusked into the sleeper at the end walls. The 1-irons (3in. by 3in. by 1/2 in.) are built into the walls at the proper level in cement masonry; the sleepers (14in. by 4in.) are notched to rest on the irons; they are

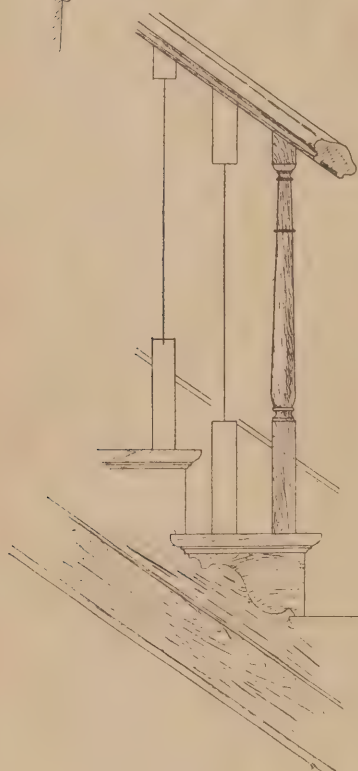
Solution to Question 47.



Solution to Question 48.



Solution to Question 52.



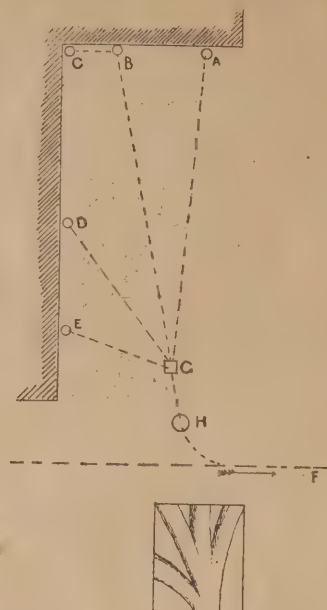
mortised and notched to take the joists. The notching for the tusks should be "easy," to enable the joists to be got in without forcing: *e* is pugging, *f* shows the boards on which the pugging rests. Ceiling joists are 4in. by 2in. They rest on pieces laid on the bottom flanges of the girders which are arranged to carry a capping-piece below, hiding the iron of the girder.

It is unnecessary to go into minute details of laying the flooring and lathing and plastering the ceiling; this is routine which the foreman understands.

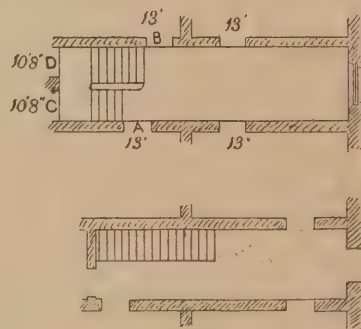
*50. The drawing shows the outline of portion of a building and the direction of public sewer, *F*, near it. Show by neat sketches how you would propose to execute drainage to serve the wastes shown: A, water-closet soil-pipe; B, the bath waste; C, the down-spouting; D, scullery waste; E, pantry waste. Give such short explanations as you think are needed. State shortly what you think is the whole duty of house drains. (51)

(See accompanying illustrations.)

I take the rainwater from C to the same trap as B, the bath waste, because this ensures the trap being always sealed (which might not be the case with a rainwater trap in dry weather). The other wastes are led direct to the connecting chamber. This chamber is made either with a purpose slab of inverts or well-formed with section inverts set in good concrete; it is to have

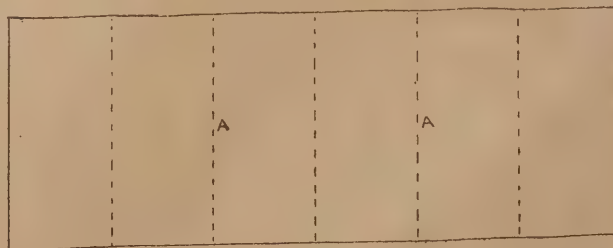
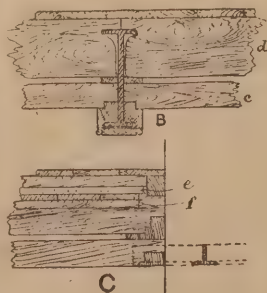


Solution to Question 50.



Solution to Question 51.

glazed brick walls laid in cement and backed with concrete. The top is to have a good fairly tight galvanized cover 2ft. 6in. by 2ft. 6in., hinged, and with fastener and key. The water-closet soil-pipe is to connect properly by a tight joint to the drain, and the upright soil-pipe is carried up the full section to a sufficient height (covered with an openwork top to keep out birds, &c.) to allow for ventilation. At B there shall be a good three-way stoneware gully with galvanized grating cover to allow of cleaning out the trap and to permit surface-water to drain into it. At D and E there shall be good and sufficient grease traps, with good easy ways of cleaning and inspecting. At H there shall be a good form of main cutting-off trap, and to the house side there shall be an inlet ventilator. There are numbers of good traps for this purpose allowing facilities for cleansing. In confined spaces a pipe may be led from the ventilating part of this trap turned up against a wall and furnished with a valve ventilator, which will only allow air to get in, and will prevent gas (bad smells) escaping.



Solution to Question 49.

It is best when possible to put on a good free open ventilator. (It should be noted that bad smells have their uses: they direct attention to things that are out of order.)

The duty of house drains is to convey completely without any retention anywhere the sewage from the house to the sewer side of the main cutting-off trap. The importance of this trap is very great; if it is defective disease germs may come from the public sewers by way of the house drains to the house and premises. The traps and ventilating arrangements on house drains are needed because portions of sewage matter lodge in the drains, no matter how perfectly smooth and carefully laid they may be. Whenever special circumstances render it necessary, arrangements should be made for additional flushing of drains. What is commonly the most defective joint in a water-closet soil-pipe is where the porcelain is attached to the metal pipe.

*51. Design staircase and landings in the hall shown so as to give access to the several doors. The staircase is of wood—oak balusters and handrail, red-pine steps, strings, &c., returned nosings, bracketed, &c. Illustrate your explanation by neat sketches. (51)

(See accompanying illustrations.)

It will be found on trial that, having regard to headroom coming up the stairs and access to door B (chamber plan), we can afford no more than 10in. width ("going")—from front of one riser to the front of the next), and it will be necessary to have a step up at C and D. The height of step from the ground floor to C and D will be 7½in. There will be seventeen steps to the landing, one step up at C and D, and five risers (about 7in. each) from the lobby to the lobby above.

The handrail terminates at the bottom at a newel having an acorn-shaped top, the shank turned to a pattern to match the baluster shown; being 5in. by 5in. at squares; firmly fixed to floor and string and step. The handrail shall be continuous, and its upper end shall be firmly fixed to the wall at the side of the door B.

52. A drawing-room 30ft. by 25ft.; ceiling, 14ft. over floor, is to be plastered. The two 25ft. walls and one 30ft. wall are outside walls. Give full and minute instructions for the plastering of the room. Sketch profile of the cornice and any other mouldings you propose to use. There are two doors, one large double-leaved door and one ordinary-sized door (in a good house); there are four windows. The combined area of doors, windows and fireplace over the level of skirting grounds is 360 sq. ft. Skirting grounds 1ft. over floor. Take quantities of the work, and estimate the cost. (51)

I assume that all the walls are to be battened to be lathed. Examine carefully the battening to see that it is true and that the grounds for skirtings, &c., are truly in one plane (on each wall) and that they are well fastened. (Note.—Woodwork ought to be secured to grounds with screws.) The cornice shown will require to be bracketed; see that this is properly done and that sufficient room is allowed everywhere for the plaster. See that proper plugs are put in for the holdfasts for the picture-rail, and arrange that the exact spots can be found after the plastering is finished. See that the ceiling joists are true. After lathing, the walls and ceiling are first- and second-coated with coarse stuff; when this is done the cornice is roughed out with gauged coarse stuff, and then the plain parts are run with fine-gauged putty. The enrichments are prepared and fixed in position with gauged putty. The architrave shown is

also run with gauged putty and the enriched mouldings fixed; the deep frieze had also better be carefully set with fine-gauged stuff.

The walls and ceiling should now be scoured and well set in fine finish.

Nett dimensions of ceiling, 27'5 by 22'5 = 618'75
Walls:—110 by 10 = 1,100 less
360 - - - - - = 740'00

Lath plaster and set - - - 1,358'75

Cornice 105'0, girt, say 2'3 - 241'5

(4 mitres).

Frieze, 110 by 2 - - - 220

Architrave, 110 by 1'5 - - 165

£ s. d.

Lath plaster and set, say 151 yds. at 3s. - - - 22 13 0

Cornice (bracketing done by carpenter), 242 sq. ft., say at 10d. 10 1 8

Enrichments, 105ft. at 4s. - - 21 0 0

Frieze, 220 sq. ft. at 6d. - - 5 10 0

Architrave, 165 sq. ft. at 8d. - 5 10 0

Enrichments, 110ft. at 1s. - 5 10 0

£70 4 8

THE GERMANS AT BABYLON.

NEBUCHADNEZZAR'S PALACE.

MR. H. J. WHIGHAM, the special correspondent of the "Morning Post," recently sent to that newspaper a most interesting account of his investigations and travels in and around Babylon, where German archaeologists have been busy for the past three years searching in the mounds of dust and debris. Many interesting remains of the great palace of King Nebuchadnezzar have been found. The chief apartment is the great hall immortalised by those words—Mene Mene Tekel Upharsin. Before it is a court with a well and two round objects which may have been the bases of pillars supporting a portico, or protections for the roots of two palm trees. Then comes the outer wall of the "kasr," going sheer down in a precipice of solid brickwork to the waterway which once was a wide canal, or perhaps a branch of the Euphrates itself. To the left of the Holy Way, whose brick pavement, covered with bitumen, is almost intact, crossed the waterway by a bridge long since departed, and proceeded in a long sweep to the great temple which lies partly disclosed in the mound which is called Amran.

The German explorers have altogether altered the supposed plan of Babylon. Instead of an enormous square which included both Babel and Birs, fifteen miles apart as the crow flies, and extended over a huge space on both sides of the Euphrates, Babylon has been reduced to a comparatively small triangle, two sides of which were formed by walls running at a slightly obtuse angle to one another, with the river subtending the angle and forming the main protection on the third side, just as the Jumna forms one side of Delhi and Agra. Dr. Koldway estimated the extent of the walls as not greater than 14 kilos, or about eight miles. In other words, Babylon was ever so much inferior in size to modern Pekin, and the "kasr," though a massive structure, could in no way compare for magnificence with the Forbidden City. The great temple in the heart of the Amran mound may have been richly enough decorated with gold and precious stones, but it would certainly, if complete to-day, fade into insignificance beside the shrine of Hussein at Kerbela; and the lesser temples of Melita in the "kasr" and of Ninop beyond Amran were seemingly rather paltry affairs. What is concealed in the Babel mound will not be known until the German expedition turns its attention in that direction, but the main aspect of the city will not be altered by discoveries there.

A Wolverhampton Competition.—The plans of Mr. A. Eaton Painter, of 30, Lichfield Street, Wolverhampton, have been accepted on the recommendation of the assessor, Mr. T. W. Aldwinckle, F.R.I.B.A., from among the eight designs sent in by members of the Wolverhampton and District Architectural Association in the competition for the Wolverhampton and District Hospital for Women.

New Patents.

These patents are open to opposition until June 30th.

1901.—Sewage Filters.—11,368. J. C. HALLER and R. H. MACHELL, both of Corporation Chambers, Dewsbury. The sewage is delivered to and discharged from three settling tanks or filters successively in repeated cycles, allowing periods of rest and aeration. The automatic apparatus is actuated by the overflow.

Drain-Boxes for Tramway Rails.—13,516. E. Y. WALSH, Malleable Steel Castings Co., Ltd., Brighouse Street, Pendleton; and J. LEIGH, Brown Street Manchester. Instead of being part of the rail, the drain-box is separate and can be attached without needing to remove or replace the rail.

1902.—Sink Supports.—877. M. J. ADAMS, 72, Park Lane, Leeds. The sink is supported on a glazed ware bracket having a projection let into the wall, the outer end bearing on a glazed ware leg.

Measuring Internal Diameter of Sewer Pipes.—4,620. R. DUDLEY, Municipal Offices, Harrogate. Two arms are pivoted near one end and provided with a tightening nut. Attached to one arm is a graduated arc by which the diameter of the pipe is indicated.

The following specifications were published on Thursday last, and are open to opposition until July 7th. A summary of the more important of them will be given next week. The names in italics are those of the communicators of the inventions.

1901.—6,340, THOMPSON (Perfect Sliding Door Co.), automatic sliding door opener. 9,100, GATES, carving machines. 9,238, SMITH & SMITH, downdraught kilns. 9,337, BARNARD, disposal of sewage sludge. 9,713, MARCHANT, valve seats. 10,134, LONGSDON, support for pipes, mains, &c. 10,142, SHANKS, water-closet and other cisterns. 10,288, WAKFER, TREGLOWN, TREGLOWN & TREGLOWN, jr., pipe wrenches. 10,346, WELCH, HEYWOOD & WOLLASTON, treatment of sewage. 11,024, CRIPPS, steel or wrought-iron chimneys. 11,130, LANCHESTER, chimney-pot. 11,150, WETTER (Mack), flexible sheets for covering columns in walls and for other building purposes. 12,371, WRAGG, apparatus for conveying sanitary pipes from place to place. 12,766, HULBURD, sliding sashes. 13,093, COYLE & NEILSON, lubrication of the axles of contractors' tipping wagons. 13,196, CLARKE, hand mortising, tenoning and grooving machine. 13,833, BROWNLOW, kilns. 14,655, BECKENHAM AND PENGE BRICKWORKS, LTD., & POCKNALL, stock bricks. 14,738, LEWIS & LEWIS, gate fastening. 18,681, BARBER, automatic fireproof doors.

1902.—1,000, ZUPPINGER, door-locks. 1,296, ADAMS, latrines. 2,048, DOWNAY, burnt brick or fireclay tile for supporting concrete between steel or iron joists. 2,814, CORPS, wallpaper removers. 3,040, HUGHES, draw-off taps. 3,057, THOMPSON (Johnson), bending machines for wood. 4,459, EGGERT, floors, ceilings, &c. 4,752, RAPP, flooring. 4,883, HEATH, course-correcting or azimuth instruments. 5,661, BLAKE & SMART, inclined and curved elevators. 5,990, HOBBS, LTD., & JEWSON, glass-houses and other buildings. 6,090, HEGEWALD, chimney cowls. 7,133, RUSSELL, ventilating underground railways.

Builders' Notes.

The Fever Hospital, Maryport has just been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent Manchester grates.

The British Fire Prevention Committee will hold to-day a comparative test between a roof covered with slates and a roof covered with vulcanite. In connection with the ever-increasing loss of life by fire, the chairman (Mr. Edwin O. Sachs) notified to the National Fire Brigades Union, in the course of their successful gathering held recently under the presidency of the Duke of Marlborough, that he was presenting a National Silver Challenge Bowl for the

smartest fire-escape crew, to be competed for on similar lines as the Union's existing Challenge Bowls for steam fire-engines and manuals. Mr. Sachs, who was present with Mr. Farrow, remarked that although the British Fire Prevention Committee was primarily associated with questions of construction and materials, its members highly appreciated the necessity of advancing in every way the interests of life-saving so gallantly practised by the firemen of the country.

A New Cement Works.—Messrs. Casebourne & Co., Ltd., of West Hartlepool, have decided to open large and up-to-date cement works on the north bank of the Tees near to Haverton Hill. Nine acres of reclaimed land have been secured by the company, and on this site they propose to erect works capable of turning out 1,000 tons of cement per week. The most modern machinery only will be used, and by means of a river wharf and railway sidings the expenses connected with the carriage of material will be reduced as far as possible. The preliminary arrangements with the N.E.R. and others have not yet been completed, and it is estimated that at least eighteen months will be required for the actual construction of the works and the setting up of the machinery. The object of the firm, of which Mr. F. T. Tristram is managing director, is to compete with, and if possible capture, the trade of the foreign makers, whose inferior brands of cement find a ready sale in the North of England by reason of their cheapness as compared with the product of existing local works. Messrs. Casebourne & Co. have extensive and well-equipped works at West Hartlepool. These will be continued. At both works new processes will be introduced.

Engineering Notes.

Economy of Modern Machinery.—The Corporation of Worcester has recently erected some new steam engines and pumping machinery in connection with the water supply to that city which illustrate the advantages of modern methods. The interest and repayment of loan (rather less than £12,000) amount to about £620 per annum, and the city engineer estimates that the economies to be effected by the new plant will not only provide for this, but save £5,700 per annum. The savings in stokers' wages are £170; in fuel, £100; repairs, £150; and electric current, £170—total, £1,190 per annum.

The E.L.B. System of Electric Lighting was adopted by the French naval authorities for the illumination of the special squadron that conveyed to Russia the President of the Republic. The *Montcalm* in particular was most elaborately equipped with devices and fittings on the E.L.B. system, the representatives of the Electric Lighting Boards Company also being entrusted with the lighting of the special banqueting saloon and the great dining tables fitted up on this ship for the entertainment of the Czar. It may be remembered that the Czar is personally much interested in the E.L.B. system, and after making some private experiments recently specially ordered it to be applied for decorative purposes at several State functions.

The Factory Act.—A conference convened by the Institution of Electrical Engineers was held recently in the theatre of the Society of Arts, John Street, Adelphi. Mr. F. Langdon (the president), who occupied the chair, said the institution in calling this conference was anxious to consider the provisions of the Factory Act of 1901 in their application to the generation of electricity. It was desirable that the electrical industry should be relieved from all possible impediments which might restrict its application to the manufactures and industries of the country. Mr. Percy Still moved:—"That in the opinion of this conference there are clauses in the Factory and Workshops Act of 1901 that are prejudicial to the industry of electricity supply." Sir Henry C. Manse seconded the proposal, which after a short discussion was carried, as also was another requesting the Institution of Electrical Engineers to take steps to approach the Home Secretary.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
May 29	Wardhouse, Aberdeen—Alterations on Steading ..		A. Taylor, Overseer, Wardhouse.
" 29	Halifax—Implement Works ..		L. Coates, Archt., Yorkshire Bank Chbrs., Waterhouse St., Halifax.
" 29	Belper—Reconstructing Culvert ..	Rural District Council ..	R. C. Cordon, Engineer, Hazelwood, Derby.
" 29	Merthyr, Wales—Fifty-three Cottages ..	Saxon Building Club ..	P. V. Jones, Architect, Hengoed.
" 29	West Hartlepool—Hospital Building ..	Corporation ..	Borough Engineer, West Hartlepool.
" 29	New Barnet—Fire Engine Station and Steam-Roller House, &c. ..	East Barnet Valley Urban District Council ..	H. York, Surveyor, Council Offices, Station Road, New Barnet.
" 29	Arnside, near Kendal—College and Out-offices ..		J. Stalker, Architect, Kendal.
" 29	Llanely—Offices at Steelworks ..		T. Arnold, Engineer, Castle Buildings, Llanely.
" 29	Lockwood, Huddersfield—Machine Works, &c. ..	D. Brown & Sons ..	J. Berry, 3 Market Place, Huddersfield.
" 29	Morecambe—Residence ..	W. Duff ..	Cressey & Keighley, Architects, Bank Chambers, Morecambe.
" 29	Whitley, near Dewsbury—Classroom ..		J. Kirk & Sons, Architects, Huddersfield.
" 30	Belfast—Rebuilding House ..	F. A. Heron ..	Young & Mackenzie, Scottish Provident Buildings, Belfast.
" 30	Belmont, Durham—Infants' School ..	Trustees of C.E. Schools ..	H. T. Gradon, 22 Market Street, Durham.
" 30	Appleton-le-Moors, near Pickering, Yorks—Farmhouse ..		J. Shepherd, Rosedale Abbey, Pickering.
" 30	Manchester—Electricity Sub-Station ..	Corporation ..	City Surveyor, Town Hall, Manchester.
" 30	Treycynon, Aberdare—Free Library and Public Hall ..	Trustees ..	D. H. Elford, 30 Weatherall Street, Aberdare.
" 30	Gellifaelog, Pen-y-darren, near Merthyr—15 Villas ..	Penybryn Villa Club ..	W. Dowdeswell, Architect, Treharis.
" 31	Chelmsford—Underpinning Asylum Chapel ..	Essex County Lunatic Asylum ..	F. Whitmore, 17 Duke Street, Chelmsford.
" 31	Brentwood, Essex—Underpinning Chapel ..		F. Whitmore, 17 Duke Street, Chelmsford.
" 31	Oswestry—Bricks, Lime, &c. ..	Cambrian Railways Co. ..	Stores Office, Cambrian Works, Oswestry.
" 31	Hythe—Shelter, Bandstand, &c. ..	Corporation ..	A. S. Butterworth, Borough Surveyor, Hythe.
" 31	Stokesley—Folding Partition, Cloakroom, &c. ..	School Board ..	R. Lofthouse & Sons, 62 Albert Road, Middlesbrough.
" 31	Redruth—Wesleyan Sunday School ..		H. W. Collins, Architect, Walreddon, Redruth.
" 31	Auchtermuchty, Scotland—Cemetery Works ..	Parish Council ..	H. P. Anderson, Clerk, Auchtermuchty.
" 31	Cardiff—Cottage Homes ..	Guardians ..	E. Seward, Architect, Queen's Chambers, Cardiff.
" 31	Govilon, Abergavenny—Lodge, Walling, &c. ..	Dr. W. E. Williams ..	C. T. Evans, 8 Queen Street, Cardiff.
" 31	Irthington, Cumberland—Altering, &c., Cottages into Mission Hall ..	Rev. T. G. Horwood ..	J. Mark, Architect, Bampton.
" 31	Llanely—Additions, &c., to Church ..		W. Wilkins, Athenaeum Square, Llanely.
" 31	Skewen, Wales—Forty Houses ..	Main Colliery Co. Ltd. ..	J. C. Rees, Architect, St. Thomas Chambers, Neath.
" 31	Southwark—Four Tenement Houses ..	Lambeth Hayles Charity Trustees ..	Waring & Nicholson, 38 Parliament Street, Westminster.
June 2	Boston, Lincs—Additions, &c., to Hospital ..	Urban District Council ..	J. Rowell, Architect, Borough Offices, Boston.
" 2	Birmingham—Foundations and Lower Storey of University Buildings ..	University ..	Aston Webb & E. Ingress Bell, 19 Queen Anne's Gate, S.W.
" 2	Aberavon—Infants' School ..	School Board ..	Thomas & James, Architects, Port Talbot.
" 2	Croydon—Screen Wall at Electric Light Works ..	Town Council ..	Borough Engineer, Town Hall, Croydon.
" 2	Darlington—Hospital Extension ..		G. G. Hoskins, Court Chambers, Darlington.
" 2	Farnworth, Lanes—Warehouse ..	Industrial Co-operative Society, Ltd. ..	J. H. Taylor, 15 Grove Street, Farnworth.
" 2	Farsley, Yorks—Boiler-house, &c. ..		W. D. Gill, Architect, Summerville Terrace, Stanningley.
" 2	Willenhall—Classrooms and Cloakrooms ..		J. P. Baker, Architect, Willenhall.
" 3	Shoeburyness—Cottages, Coal Store, Office, &c. ..	School Board ..	H. Harris, Surveyor, Clarence Chambers, Southend-on-Sea.
" 3	London, E.O.—Alterations, &c., to Underground Convenience ..	Urban District Council ..	Engineer, Guildhall, E.O.
" 4	Hove, Sussex—Portland Cement ..	Corporation ..	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 4	Scarborough—Infectious Diseases Hospital ..	Town Council ..	J. W. Smith, Borough Surveyor, Town Hall, Scarborough.
" 4	Epping—Infants' School ..	School Board ..	Harrington & Ley, 65 Bishopsgate Street Without, E.O.
" 5	Queenstown, Ireland—100 Artisan's Dwellings ..	Naval Dwellings Co., Ltd. ..	W. H. Hill & Son, 28 South Mall, Cork.
" 5	Lambeth, S.E.—Slipper Baths ..	Borough Council ..	Borough Engineer, Town Hall, Kennington Green, S.E.
" 5	Prestwich—Temporary Hospital Pavilion ..	Union Guardians ..	T. Worthington & Son, 46 Brown Street, Manchester.
" 8	Ranskill—Additions to "The Grange" ..		E. H. Ballan, Architect, Oriental Chambers, Doncaster.
" 9	Boughton, Nottingham—Engine and Boiler-houses ..	Water Committee ..	W. B. Starr, 12 St. Peter's Gate, Nottingham.
" 9	Barnes—Seven Houses ..		F. & W. Stocker, 90 and 91 Queen Street, Cheshire, E.C.
" 9	Edmonton—Schools ..	School Board ..	H. W. Dobb, 99 Church Street, Lower Edmonton.
" 9	Pentre, Wales—School ..	Ystradgofwg School Board ..	J. Rees, Architect, Hillside Cottage, Pentre.
" 10	Birkenhead—Warehouse ..	Great-Western Railway Co. ..	Engineer, Paddington Station.
" 10	West Ham—Repair, &c., of Eighteen Schools ..	School Board ..	W. Jacques, 2 Pen Court, E.O.
" 10	West Ham—Mortuary ..	Borough Council ..	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
" 10	Grimsby—Alterations, &c., to Police Station ..	Corporation ..	H. G. Whyatt, Borough Surveyor, Town Hall Square, Grimsby.
" 12	Hastings—Boundary Wall ..	Guardians ..	A. W. Jeffery, 5 Havelock Road, Hastings.
" 14	Castlebar—Extensions to Asylum ..		J. T. Kelly, Clerk, Lunatic Asylum, Castlebar.
" 16	Birkdale—Cemetery Chapel and Lodge ..	Urban District Council ..	A. Schofield, 45 Weld Road, Birkdale.
" 16	Dewsbury—Covered Market ..	Corporation ..	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
" 17	Rugby—Five Shops, Assembly Hall, &c. ..	Co-operative Society ..	J. T. Franklin, Architect, Regent Street, Rugby.
ENGINEERING:			
May 29	Hastings—Covering Pipes with Non-Conducting matrl ..	Guardians ..	A. W. Jeffery, 5 Havelock Road, Hastings.
" 30	Burton-on-Trent—Electric Tramway Plant ..	Corporation ..	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
" 31	Leigh-on-Sea, Essex—Reservoir, &c. ..	Urban District Council ..	Bailey-Denton, Son, Lawford & Symons, Palace Chmbrs., Westminster.
" 31	Leigh, Essex—Air Compressor ..	Urban District Council ..	Bailey-Denton, Son, Lawford & Symons, Palace Chmbrs., Westminster.
" 31	Prestonpans, Scotland—Waterworks ..		W. A. Carter, 5 St. Andrew Square, Edinburgh.
" 31	Trowbridge—Trade Effluent Disposal Works ..	J. & T. Beaver ..	W. H. Stanley, Civil Engineer, Market House Chmbrs., Trowbridge.
" 31	Thorney, Peterborough—Gas Mains ..	Gas Company ..	A. J. Forrest, Bedford Office, Thorney, Peterborough.
" 31	Wingate, Durham—Reservoir, &c. ..	Water Co., Ltd. ..	T. Bower, Engineer, Ribblesdale House, West Hartlepool.
" 31	Southampton—Dredging ..	Harbour Board ..	W. Bowyer, Clerk, Town Quay, Southampton.
" 31	Bridgend, Glamorgan—Electric Wiring and Fittings ..	Committee of County Asylums ..	W. E. R. Allen, Clerk, Glamorgan County Offices, Cardiff.
" 31	Littlehampton—Water-Mains ..	Urban District Council ..	H. Howard, Surveyor, Town Offices, Littlehampton.
June 1	Sandhaven, Scotland—Harbour Works ..		J. Barron, 1 Bon Accord Street, Aberdeen.
" 2	Wigan—Waterworks ..	Rural District Council ..	Heaton, Ralph & Heaton, Civil Engineers, Wigan.
" 2	Neiston, Scotland—Waterworks ..	First District Committee ..	R. F. Miller, 109 Bath Street, Glasgow.
" 2	Belfast—Dredger ..	Harbour Commissioners ..	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast.
" 2	Beckenham—Boiler, Seatings, Foundations, Disinfecting Chamber, &c. ..	Urban District Council ..	J. A. Angell, Surveyor, Council Office, Beckenham.
" 2	Alexandria, Egypt—Beacon Buoys, &c. ..	Ports and Lighthouses Administration ..	Controller-General, Ports and Lighthouses, Alexandria.
" 2	Swansea—Refuse-destructor ..		G. Bell, Borough Surveyor, Guildhall, Swansea.
" 3	Alexandria, Egypt—Gas Beacons, &c. ..	Administration of Ports and Lighthouses ..	Office of Ports and Lighthouses Administration, Alexandria.
" 3	Pleasley, Mansfield—Waterworks ..	Blackwell Rural District Council ..	G. & F. W. Hodson, Engineers, Loughborough.
" 3	London, S.W.—Feed Water Tanks ..	London County Council ..	Engineer's Department, County Hall, Spring Gardens, S.W.
" 3	Newhaven—Iron Hospital Building ..	Joint Hospital Committee ..	E. Knightley, Clerk, Council's Offices, Newhaven, Sussex.
" 4	Chorley, Lanes—Gas Engines and Pumps ..	Rural District Council ..	A. Jolly, Surveyor, Council Offices, Chorley.
" 5	London, S.W.—Tug ..	Lords Commissioners of the Admiralty ..	Secretary of the Admiralty, Ship Branch, Whitehall, S.W.
" 5	Withington, Lanes—Boiler ..	Chorlton Union Guardians ..	Manchester Steam Users' Association, 9 Mount Street, Manchester.
" 6	Culkin, Scotland—Landing Ship ..	Sutherland County Council ..	D. & O. Stevenson, 84 George Street, Edinburgh.
" 6	Beckenham—Incandescent Lamps ..	Electric Lighting Committee ..	R. F. Wilson, 66 Victoria Street, Westminster.
" 7	Dudley—Incandescent Lamps, &c. ..	Electric Lighting Committee ..	R. F. Wilson, 66 Victoria Street, Westminster.
" 7	Glasgow—Economiser, Condensing Plant, &c. ..	Corporation ..	W. A. Chamen, 75 Waterloo Street, Glasgow.
" 9	Mevagissey—Repairs to Pier ..		P. Hunkin, Clerk, Mevagissey.
" 9	Kingsbury, Somerset—Waterworks ..	Langport Rural District Council ..	Bailey-Denton, Lawford & Symons, Palace Chambers, Westminster.
" 10	Longport—Waterworks ..	Rural District Council ..	Bailey-Denton, Son, Lawford & Symons, Palace Chmbrs., Westminster.
" 10	West Ham—Tramways ..	Corporation ..	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
" 11	Calcutta—Sand Washers ..	Corporation ..	Engineer, Municipal Office, Calcutta.
IRON AND STEEL:			
May 30	Hull—Cast-iron Holding-down Plates ..	Corporation ..	A. E. White, City Engineer, Town Hall, Hull.
" 30	Ulverston—Gulleys, Grates, &c. ..	Urban District Council ..	H. Whitlow, Surveyor, Theatre Street, Ulverston.
" 31	Oswestry—Tubes and Fittings, &c. ..	Cambrian Railway Co. ..	Stores Office, Cambrian Works, Oswestry.
" 31	Walsall—Tubes and Fittings, Iron, &c. ..	Corporation ..	Gas Office, Bridge Street, Walsall.
June 31	Kenmore, Scotland—Wire Fence ..		D. Strang, Gamekeeper, Glenfalloch.
" 4	London, E.C.—Railway Stores ..	East Indian Railway Co. ..	C. W. Young, Nicholas Lane, E.C.
" 9	Brighton—Points, Crossings, &c. ..	Town Council ..	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.
" 9	Brighton—Tramrails ..	Town Council ..	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.
" 10	Tyldesley, Lanes—Cast-iron Pipes, Specials, &c. ..	Urban District Council ..	W. H. S. Gendall, Engineer, Gasworks, Tyldesley.
" 24	Bury, Lanes—Rails, &c. ..	Tramways Committee ..	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
PAINTING AND PLUMBING:			
May 29	Barning Heath, Maidstone—Painting	St. Olave's Union Guardians	Kent County Asylum, Barning Heath, Maidstone.
" 29	London, S.E.—Painting, &c., Children's Home	St. Olave's Union Guardians	Newman & Newman, 31 Tooley Street, S.E.
" 29	London, S.E.—Painting, &c., Union Offices	St. Olave's Union Guardians	Newman & Newman, 31 Tooley Street, S.E.
" 31	Oswestry—Oils, Lead, Paints, Varnishes	Cambrian Railway Co.	Stores Office, Cambrian Works, Oswestry.
" 31	Walsall—Lead Piping, Brushes, &c.	Corporation	Gas Office, Bridge Street, Walsall.
June 2	Swindon—Painting, &c., at Hospital	Hospital Board	Halliday & Rodger, 14 High Street, Cardiff.
" 3	Hove, Sussex—Distemping, &c., Hospital	Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 10	Tyldesley, Lancs.—Lead Piping, &c.	Urban District Council	W. H. S. Gendall, Engineer, Gasworks, Tyldesley.
" 10	West Ham—Painting, &c., Eighteen Schools	School Board	W. Jacques, 2 Fen Court, E.C.
" 11	London, S.E.—Painting at Infirmary	Lambeth Guardians	W. Thurnall, Clerk, Offices, Brook Street, Kennington Road, S.E.
ROADS AND CARTAGE:			
May 29	Gateshead—Paving, &c.	Corporation	Borough Engineer, Town Hall, Gateshead.
" 29	New Brompton, Kent—Materials	Gillingham Urban District Council	F. O. Boucher, Clerk, Gardiner Street, New Brompton.
" 30	Ulverston—Flags, Kerbs, &c.	Urban District Council	H. Whitlow, Surveyor, Theatre Street, Ulverston.
" 30	Aylesbury—Road Materials	Urban District Council	G. H. Bradford, Surveyor, Town Hall, Aylesbury.
" 30	Cramlington—Stone and Slag	Urban District Council	R. Nicholson, Clerk, Morpeth.
" 31	Shotton Colliery—Street Formation	Urban District Council	Shotton Colliery Office.
" 31	Little Woolton, Liverpool—Macadam	Urban District Council	R. Simmons, Surveyor, Grange Lane, Gateacre, near Liverpool.
" 2	Dartmouth—Footpaths	Urban District Council	A. Smith, Borough Surveyor, Dartmouth.
" 2	Leeds—Road Materials, &c.	Rural District Council	H. H. Hodgson, Belle Vue Avenue, North Lane, Roundhay, Leeds.
" 3	Croydon—Road Repair	Town Council	Borough Road Surveyor, Town Hall, Croydon.
" 3	Tottenham—Repair of Tar and Asphalt Paving	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
" 3	Leyton—Paving, Channelling, &c.	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton, E.
June 4	Andover—Materials	Rural District Council	J. Wormald, District Surveyor, Andover.
" 4	Hull—Road Alterations	North-Eastern Railway Company	T. M. Newell, Engineer, Dock Office, Hull.
" 5	London, W.—Granite Spalls	Kensington Guardians	J. H. Rutherglen, Guardians' Offices, Marlboro Road, Kensington.
" 5	Chichester—Street Works	Corporation	City Surveyor, Chichester.
" 7	Burnley—Widening Lane	Rural District Council	S. Edmondson, 18 Nicholas Street, Burnley.
" 10	Southall, Middlesex—Making-up Road	Urban District Council	R. Brown, Surveyor, Public Offices, Southall.
" 10	West Ham—Paving Roads on Tramway Routes	Town Council	J. G. Morley, Borough Engineer, Town Hall, West Ham.
" 12	Uxbridge—Roadworks	Rural District Council	J. F. Stow, Surveyor, Corn Exchange, Uxbridge.
" 14	Uckfield, Sussex—Hire of Road Rollers	Rural District Council	F. Holman, Clerk, High Street, Lewes.
SANITARY:			
May 29	Lichfield, Staffs.—Sewerage Works	Rural District Council	W. E. Rogers, Surveyor, Rugeley.
" 29	Castleford—Sewer	Urban District Council	W. Green, Surveyor, Carlton Street, Castleford.
" 29	Oldmeldram, Scotland—Sewer, &c.	Urban District Council	Jenkins & Marr, 16 Bridge Street, Aberdeen.
" 30	Ulverston—Pipes, Disinfectants, &c.	Urban District Council	H. Whitlow, Surveyor, Theatre Street, Ulverston.
" 31	Oswestry—Drain Pipes, Lime, &c.	Cambrian Railways Co.	Stores Office, Cambrian Works, Oswestry.
June 2	Otley, Yorks.—Sewerage and Sewage-disposal Works	Urban District Council	J. E. Sharpe, Surveyor, Council Offices, Otley.
" 3	Sudbury, Suffolk—Sewerage Works	Drainage Committee	T. W. A. Hayward, Borough Surveyor, Town Hall, Sudbury.
" 3	Barking, Essex—Drainage Works	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
" 3	Bristol—Drainage and Sewer Works	Sanitary and Improvement Committee	T. H. Yabbicom, 63 Queen Square, Bristol.
" 3	Leeds—Sewerage Works	Rural District Council	Spinks & Pilling, 20 Park Road, Leeds.
" 4	Burton-on-Trent—Sewerage Works	Corporation	G. T. Lynam, Borough Surveyor, Town Hall, Burton-on-Trent.
" 4	Thames Ditton—Sewer, &c.	Urban District Council	A. J. Henderson, Council Offices, Brabant Villa, Thames Ditton.
" 4	Barton-under-Needwood—Sewerage Works	Sutbury Rural District Council	Willcox & Raikes, 63 Temple Row, Birmingham.
" 4	Hove, Sussex, Sewer Work	Corporation	Borough Surveyor, Town Hall, Hove.
" 10	Bridgwater, Somerset—Sewer	Town Council	Borough Surveyor, Municipal Buildings, Bridgwater.
TIMBER:			
May 31	Oswestry—English and Foreign Timber	Cambrian Railway Co.	Stores Office, Cambrian Works, Oswestry.
" 31	Walsall—Timber	Corporation	Gas Office, Bridge Street, Walsall.
June 6	Cardiff—Pitwood	Nixon's Navigation Co., Ltd.	J. L. Herbert, Secretary, Bute Docks, Cardiff.
" 9	South Helton—Timber	Coal Co., Ltd.	J. R. Lambert, South Helton, Sunderland.
" 9	London, W.C.—Firewood	London School Board	Contracts Sub-Depart., School Bd. Offices, Victoria Embankment, W.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May 31	Sedgefield—Infectious Diseases Hospital	£10.	W. Snowden, Surveyor, Council Office, Sedgefield.
June 1	Knaresborough—Infectious Disease Hospital	£100, £50.	J. T. Taylor, Municipal Offices, Harrogate.
" 2	Belfast—Oronation Decorations	—	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast.
" 12	Crewe—Municipal Office and Council-Chamber	£50, £25.	Borough Surveyor, Municipal Offices, Crewe.
" 16	Hartshill, Stoke-on-Trent Nurses Home	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 17	Clonmel—Ten Labourers' and Two Artizans' Dwellings	—	J. F. O'Brien, Town Clerk, Corporation Offices, Clonmel.
" 22	Rhymney—Ottage Hospital	—	B. Jones, 29 Plantation Street, Rhymney.
" 27	West Hartlepool—School	£75, £35.	J. R. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted.)	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaya Uprava, St. Petersburg.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.O. Offices, Tottenham.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.
No date.	Lianguique—Mixed School	£10.	W. L. Evans, Clerk, Gwaun Cae Gurwen, R.S.O.

CURRENT MARKET PRICES

FORAGE.				OILS AND PAINTS.				METALS.				TIMBER.			
		£ s. d.	£ s. d.			£ s. d.	£ s. d.			£ s. d.	£ s. d.			£ s. d.	£ s. d.
Beans	per qr.	1 10 0	—	Castor Oil, French ..	per cwt.	1 5 8	1 6 10	Copper, sheet, strong ..	per ton	69 0 0	—	Fir, Dantzic and Memel ..	per load	3 0 0	4 10 0
Clover, best ..	per load	4 15 0	5 10 0	Coza Oil, English ..	do.	1 7 6	—	Iron, Staffs, bar ..	do.	6 5 0	8 10 0	Pine, Quebec, Yellow ..	per load	4 7 6	5 0 0
Hay, best ..	do.	5 5 0	5 12 6	Copperas	per ton	2 0 0	—	Do. Galvanized Corru-	do.	11 10 0	12 0 0	Do. Pitch	do.	2 14 0	3 11 0
Sainfoin mixture ..	do.	4 10 0	5 5 0	Lard Oil	per cwt.	2 9 6	—	gated sheet	do.	11 10 0	12 0 0	Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Straw	do.	1 13 0	2 4 0	Lead, white, ground, carbonate ..	do.	1 4 10	—	Do. do. English common	do.	11 11 3	—	Do. Petersburg ..	per bundle	0 8	—
				Do. red	do.	1 0 4	—	brands	do.	11 18 9	—	Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0	—
				Linseed Oil, barrels ..	do.	1 12 9	1 13 0	Do. sheet, English 3lb	do.	13 5 0	—	Do. do. 4th & 3rd ..	do.	10 15 0	12 5 0
				Petroleum, American ..	per gal.	0 0 6	0 0 7	per sq. ft. and upwards ..	do.	13 5 0	—	Do. do. unsorted ..	do.	5 12 6	6 10 0
				Do. Russian	do.	0 0 6	0 0 6	Do. pipe	do.	13 15 0	—	Do. Riga	do.	6 15 0	12 10 0
				Pitch	per barrel	0 7 0	—	Nails, cut clasp, 3in. to 6in. ..	do.	9 5 0	—	Do. Petersburg 1st Yellow ..	do.	10 0 0	17 5 0
				Shellac, orange ..	per cwt.	5 12 0	—	Do. floor brads ..	do.	9 0 0	—	Do. do. 2nd ..	do.	9 0 0	12 10 0
				Soda, crystals ..	per ton	3 2 6	3 5 0	Steel, Staffs, Girders and	do.	5 15 0	6 5 0	Do. do. White ..	do.	7 5 0	12 10 0
				Tallow, Home Melt ..	per cwt.	1 12 0	—	Angles	do.	6 10 0	7 0 0	Do. Swedish ..	do.	7 15 0	11 15 0
								Do. do. Mild bars ..	do.	136 7 6	136 17 6	Do. White Sea ..	do.	13 5 0	17 5 0
								Tin, Foreign	do.	136 0 0	137 10 0	Do. Quebec Pine, 1st ..	do.	11 10 0	24 10 0
								Do. English ingots ..	do.	21 0 0	—	Do. do. 2nd ..	do.	11 15 0	17 0 0
								Zinc, sheets, Silesian ..	do.	21 0 0	—	Do. do. 3rd &c. ..	do.	9 10 0	—
								Do. do. Vieille Montagne ..	do.	21 10 0	—	Do. Canadian Spruce, 1st	do.	7 10 0	12 10 0
								Do. Spelter	do.	18 10 0	18 15 0	Do. do. 3rd & 2nd ..	do.	7 0 0	9 0 0
												Do. New Brunswick ..	do.	7 5 0	8 0 0
												Battens, all kinds ..	do.	7 0 0	10 5 0

CURRENT MARKET PRICES—cont.

Flooring Boards	lin.	£ s. d.	£ s. d.
prepared, 1st	per square	0 8 9	0 11 3
Do. 2nd	do.	0 10 0	0 10 3
Do. 3rd &c.	do.	0 7 0	0 8 6

HARD WOODS.	per load	£ s. d.	£ s. d.
Ash, Quebec	3 17 6	4 10 0	
Birch, Quebec	3 12 6	3 17 6	
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, lin., Cuba	per ft. sup.	0 0 4	—
Do. Honduras	do.	0 0 1	—
Do. Tobasco	do.	0 0 1	—

Masters and Men.

The Bath Painters' Wages have been increased from 6d. to 7d. per hour.

The Bricklayers in Long Eaton have been given an advance of wages, bringing up the wages to 9d. per hour.

Two hundred Brick Moulders at Ilford, employed in the brickyards, are on strike. About a dozen masters are affected. Some time ago the moulders were paid at the rate of 5s. per 1,000 bricks made, and in compliance with their demands the rate was raised to 5s. 6d. Another demand was made for an increase, and 6s. was paid. Now the brickmakers are asking for 6s. 6d.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABERDEEN (MON.)—For the erection of 22 cottages, for Aberdeenshire Building Club. Mr. George C. Hillard, architect, Market-chambers, Aberdeenshire. J. Newcombe, Ebbw Vale ... £5,880
Williams & Rogers, Cwm ... 5,720
D. Lewis, Aberdeenshire ... 5,065
Gould & Mills, Risca ... 4,970
* Accepted at £4,180, plans being reduced.

ABERTILLERY (MON.)—For the erection of 22 double cottages for Taylors Building Club, at Abertillery. Mr. George C. Hillard, architect, Aberdeenshire. D. Lewis, Aberdeenshire ... £5,280
D. Powell ... £4,980
H. Tudor ... 5,088
N. Bagley ... 4,700
J. Jones ... 5,085
[Rest of Abertillery.]

ATTLEBOROUGH—For the erection of a police sergeant's house and lock-up, for the Norfolk County Council. Mr. T. H. B. Heslop, M.I.C.E., county surveyor, Norwich. J. S. Smith, Norwich ... £1,770 0
H. P. Bowden, Wymondham ... 1,878 10
G. B. Ketteringham, Attleborough ... 1,618 10
E. L. Semmence, Wymondham ... 1,510 0
T. H. Blyth, Foulsham ... 1,488 0
* Accepted.

BOREHAM WOOD (HERTS.)—For the erection of two small houses, Furze Hill Road, for Mrs. Sarah Wise. Mr. Henry James Wise, A.R.I.B.A., architect, Elstree, Herts. C. Brightman ... £1,255
G. Wiggs ... 1,138
Brace & Clark ... 1,100
* Accepted. [All of Watford.]

CARDIFF—For the erection of a chapel in Cathedral Road, Cardiff, for the Presbyterian Church of Wales. Mr. Edgar G. C. Down, A.R.I.B.A., architect, 31 High Street, Cardiff. W. Thomas & Co. ... £8,970 0
G. Griffiths ... 6,778 5 0
D. W. Davies ... 6,932 0 0
Shepton & Sons ... 6,455 10 0
F. Williams ... 6,382 0 0
Lattey & Co. ... 6,240 0 0
C. C. Dunn ... 6,200 0 0
D. Thomas & Sons ... 6,140 0 0
E. Turner & Sons ... 6,141 0 0
Price Bros. ... 6,051 6 4

E. R. Evans Bros. ... 5,799 9 8
W. T. Morgan ... 5,580 0 0
* Accepted. [All of Cardiff.]
CARDIFF—For the erection of stores in Severn Road, Cardiff, for Messrs. W. Emerson & Sons. Mr. E. G. C. Down, A.R.I.B.A., architect, 31 High Street, Cardiff. W. T. Morgan ... £900 0
Geo. Couzens & Co. ... 588 10
C. C. Dunn ... 580 0
* Accepted.

CHADWELL HEATH (ESSEX)—For the erection of farm buildings at the Council's asylum, Chadwell Heath, Essex, (nearest station, Goodmayes, G.E.R.) Mr. J. G. Morley, borough engineer. Dupont & Co., Colchester ... £3,370
Gregor & Sons, Jupp Road, Stratford ... 6,425
H. J. Carter, Grays ... 6,351
C. North, Manby Road, Stratford ... 6,287
C. Wise, works manager, West Ham ... 6,281
S. Parmenter, Belle Vue, Braintree ... 5,933
* Accepted.

CROYDON—For the erection of a detached house, Dingwall Avenue, Mr. A. Broad, architect, 22 George Street, Croydon. Quantities by the architect. Hanscomb & Smith ... £1,385
Smith & Son ... £1,178
Worsfold & Sons ... 1,325
J. Horrocks ... 1,175
E. J. Saunders ... 1,230
Huntley Bros. ... 1,175
Smith & Son, Ltd. ... 1,275
Akers & Co. ... 1,170
D. W. Barker ... 1,185
Pearson & Co. ... 1,120
S. Hart ... 1,180
W. Potter ... 1,075
* Accepted.

EALING, W.—Accepted for the erection of D'Ereshy House, Ealing Common. Messrs. Palgrave and Co., architects, Westminster. Messrs. Whitehead & Co., Ltd., Clapham ... £19,570

GAERWEN (ANGLESEA)—For additions and alterations to the C.M. Chapel, Gaerwen, Anglesea. Messrs. Owen Morris Roberts and Son, architects and surveyors, Portmadoc. J. & R. Evans, Gaerwen ... £4,363
J. P. Thomas, Llanfair ... 3,075
W. Williams & Son, Holyhead ... 2,970
W. & O. Prichard, Llanfair ... 2,916
R. Jones, Llanwnda ... 2,788
W. Owen, Chwilog ... 2,727
W. Prichard, Bodford ... 2,706
R. & J. Williams, Bangor ... 2,583
I. Evans, Menai Bridge ... 2,397
* Accepted.

GLASGOW—For the painters' work of the new general hospital now being erected at Stobhill, Springburn, for the Glasgow Parish Council. Messrs. John Thompson and K. D. Sandilands, architects, 241 West George Street, Glasgow. J. L. Anderson & Co. ... £7,100 0 0
A. L. Anderson & Co. ... £7,100 2 2
W. Thompson ... 6,541 8 8
A. Kemp ... 6,435 14 5
C. Paton ... 5,725 12 11
W. D. Horne ... 5,073 11 9
Macfarlane & Smith ... 4,961 8 3
T. C. Wilson ... 4,907 0 0
C. Carleton & Co. ... 4,973 11 3
McClulloch & Co. ... 4,925 14 3
A. Stirling ... 4,901 8 3
R. Henderson, Pollokshields ... 4,774 10 0
J. Duncan ... 4,770 0 0
A. Anderson ... 4,505 0 0
J. F. Edgar, 116 Eglington Street ... 4,370 0 0
* Accepted. [All of Glasgow.]

GLASGOW—For (Contract No. 6) electric wiring at the new general hospital, Stobhill, for the Glasgow Parish Council. Mr. W. Arnott, engineer, 79 West Regent Street, Glasgow. Osborne & Hunter ... £6,850
Malcolm & Allan ... 6,790
McAlpine's Electrical Company ... 6,691
McAuley, Clark, & McLellan ... 6,273
Lowden Bros. ... 6,133
Anderson & Munro ... 5,989
Reid & Co. ... 5,670
Cassello & Co. ... 5,589
Cook & Gilchrist, Newcastle ... 5,412
J. Findley & Co. ... 4,948
McCulloch, Potter, & Co. ... 4,855
J. McKenzie & Co. ... 4,511
Middleton & Townsend, Edinburgh ... 4,197
C. Hamilton, Ltd., 247 St. Vincent Street ... 4,197
* Accepted. [Rest of Glasgow.]

ILKLEY (YORKS.)—Accepted for the erection of Baptist Sunday School, Ilkley, Yorks. Messrs. Garride and Pennington, architects, Pontefract and Castleford. George Smith, builder, &c., Ilkley ... £2,650
62 other tenders received.

IPSWICH—For the erection of the new Britannia Road Schools, for the School Board. Messrs. Brown and Burgess, architects, Princes Street Chambers, Ipswich. A. Sadler ... £9,400 0
Cooper & Haward ... 9,202 0

M. Death ... 8,575 0
H. Linzell ... 8,405 0
F. Bennett ... 8,770 0
Griffwood & Son ... 8,583 0
W. H. Death ... 8,570 0
F. Thurman ... 8,403 16
Y. Marriott ... 8,475 0
E. Catchpole ... 8,300 0
S. Kenny ... 8,080 0
T. Parkinson & Son ... 7,777 0
C. Burlett ... 7,402 10
C. Roper ... 7,257 0
* Accepted, subject to the approval of the Education Department.

KING'S LYNN—For carrying out alterations and additions to shop, High Street, for Mr. Gemmell. Messrs. W. Jarvis and Son, architects, King's Lynn. Allowed for old materials.

Tash, Langley & Co. ... £383
Bardell Bros. ... 281 0
J. Medwell ... 290 0
W. H. Brown ... 253 0
R. Dye ... 240 0
* Accepted. [All of Lynn.]

KIRKCALDY—Accepted for the demolition and reconstruction of "The Wheat Sheaf Inn," for Mr. James Anderson. Mr. D. Forbes Smith, A.R.I.B.A., architect, Kirkcaldy. Quantities of the architect. Joiners—Bogie & Nicol ... £104 8 9

Mason—D. Wilkie, Sinclairtown ... 281 0 0
Plumber—H. Hutchison ... 144 9 0
Plasterer—Wm. Grant ... 96 0 0
Slater—D. Stark ... 5 7 6
[Rest of Kirkcaldy.] [Total £234 5 3.]

KIRKCALDY—Accepted for the erection of tenements in Harriet Street, Sinclairtown, for Mr. Colin Cummings. Mr. D. Forbes Smith, A.R.I.B.A., architect, Kirkcaldy. Mason—D. Wilkie, Sinclairtown ... 744 0 0
Joiner—H. Masterton, Sinclairtown ... 531 0 0
Plasterer—H. Masterton, Sinclairtown ... 285 0 0
Plumber—Geo. Dougall, Pathhead ... 125 10 0
Slater—D. Johnston, Dysart ... 63 16 0
[Total £1,750 6 0.]

LEICESTER—For the erection of a new shop, for Mr. W. Skillington, Humberstone Gate, Leicester. Messrs. J. B. Everard and S. Perkins Pick, F.R.I.B.A., architects, Leicester. J. E. Johnson & Son ... £1,455 0
J. C. Kellert & Son ... 1,483 0
Clarke & Garrett ... 1,387 0
W. Moss & Sons, Loughborough ... 1,353 0
T. Herbert ... 1,350 0
J. Hutchinson & Son ... 1,330 7
A. & W. Chambers ... 1,330 0
H. Herbert & Sons ... 1,305 0
[Rest of Leicester.]

LLANDERIE—Accepted for the erection of Mynydd-Cerrig Road School, for the Llanderie Urban District School Board. Mr. David Jenkins, F.R.I.B.A., architect, Llandrie. John & Henry Vaughan, Tycoes, Pantyffynnon, R.S.O. ... £1,581 13

LLANDILO—Accepted for addition and alteration to Miss Price's house and shop, Rhosmaen Street. Mr. David Jenkins, F.R.I.B.A., architect, Llandilo. Thomas Bros., Llandilo ... £2180

LLANDILO—Accepted for the erection of a chemical laboratory to the Intermediate School for the Governors. Mr. David Jenkins, F.R.I.B.A., architect, Llandilo. Thomas Bros., Llandilo ... £200

LLANDILO—Accepted for rebuilding Canton Cottage for Councilor Jones, Canton Stores. Mr. David Jenkins, F.R.I.B.A., architect, Llandilo. The owner and local tradesmen ... £225

LLANFYNDYD—Accepted for the restoration of the Parish Church, for the Vicar and Churchwardens. Mr. David Jenkins, F.R.I.B.A., architect, Llandilo. Evan Evans, Llanybyther, R.S.O. ... £2780

LLANGADOCK—Accepted for the erection of an additional classroom for the Llangadock Board School. Mr. David Jenkins, F.R.I.B.A., architect, Llandilo. Morgan & Davies, Llangadock ... £290 5

LONDON—For the erection of a laundry centre at Ancona Road School, Plumstead, for the London School Board. Mr. T. J. Bailey, architect. W. Downs ... £1,857
W. J. Mitchell & Sons ... £1,595
F. & H. P. Higgs ... 1,547
J. Marsland & Sons ... 1,535
W. Johnson & Co., Ltd. ... 1,721
Kirk & Randall ... 1,529
G. E. Wallis & Sons ... 1,684
E. Triggs ... 1,526
E. P. Bulled & Co. ... 1,674
J. & C. Bowyer ... 1,514
J. Garrett & Sons ... 1,657
Johnson & Co. ... 1,508
J. Smith & Sons, Ltd. ... 1,507
T. D. Leng ... 1,487
* Recommended for acceptance.

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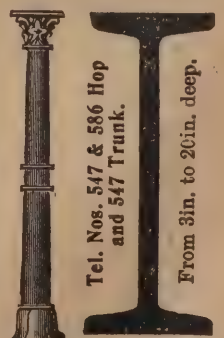
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SECTION SHEETS AND ESTIMATES ON APPLICATION.

53b, SOUTHWARK STREET, LONDON, S.E.



LONDON.—For adaptation of building for residential school for blind boys at Linden Lodge, Wandsworth Common, for the London School Board. Mr. T. J. Bailey, architect.—

T. Hooper & Son	£5,334 10
General Builders, Ltd.	4,354 0
J. Marsland & Sons	4,020 0
J. & C. Bower	3,094 0
J. & M. Patrick	3,057 0
W. Hammond	3,040 0
J. Carmichael	3,590 0
Lathey Bros.	3,563 0
J. Garret & Son	3,415 0
E. Triggs	3,412 0

* Recommended for acceptance.

LONDON.—For drainage and sanitary works at Vittoria Place School, Harnsbury, for the London School Board. Mr. T. J. Bailey, architect.—

Johnson & Co.	£3,202 16 0
T. Cruwys	3,244 8 0
C. W. Kullingback & Co.	3,100 0 0
Marehant & Hirst	3,150 0 0
G. Neal	3,107 0 0
E. P. Beattie	3,062 5 1
Stevens Bros.	2,996 0 0
McDonnell & Sons	2,980 0 0
E. Lawrence & Sons	2,879 0 0
G. S. S. Williams & Son	2,782 0 0
Willmott & Sons, Hitchin	2,527 0 0

* Recommended for acceptance.

LONDON, S.W.—For making-up the roadway and paving the footways of Niton Street, Fulham, for the Fulham Borough Council. Mr. Francis Wood, A.M.I.C.E., borough surveyor, Town Hall, Fulham, S.W.—

Nowell & Co.	Roadway.	£1,160 0
J. Mears		1,143 0
E. Parry & Co.		1,124 0
G. Wimpey & Co.		1,121 0

Lawrence & Thacker ... 1,100 0
H. J. Greenham ... 1,063 0

Footways.

Nowell & Co. (York Stone)	440 0
Imperial Stone Company	300 0
Patent Adamant Stone Company	285 0
Patent Indurated Stone Company	280 15
Victoria Stone Company (Indurated)	285 0

LONDON, S.W.—For the erection of a new school, Mitcham Road, Tooting, for the London School Board. Mr. T. J. Bailey, architect.—

G. E. Wallis & Sons	£28,092	F. & H. F. Higgs	£26,130
E. Lawrence & Sons	27,830	Lathey Bros.	26,081
J. Simpson & Son	27,498	Holliday & Greenwood, Ltd.	26,071
Martin, Wells, & Co.	26,906	J. Carmichael	26,062
Holloway Bros.	26,940	W. Johnson & Co., Ltd.	25,000
J. Garrett & Son	26,360	J. & M. Patrick	25,540
Leslie & Co., Ltd.	26,348	W. H. Lorden & Son	25,522
Stimpson & Co.	26,130		

* Recommended for acceptance.

LONDON, W.—For the erection of boundary walls and railing to enclose the site of the proposed new workhouse and infirmary at Wormwood Scrubbs, for the Hammersmith Board of Guardians. Messrs. Giles, Gough, and Trollope, architects, 28 Craven Street, Strand, London.—

A. R. Bulley	£4,031	Wilson Bros. & Lamplough	£3,043
J. Barker & Co.	4,490	J. McManus	3,893
Sabey & Son	4,373	Holliday & Greenwood, Ltd.	3,877
F. & H. F. Higgs	4,290	H. J. Greenham	3,850
Hibberd Bros., Ltd.	4,190	Viney & Stone	3,824
S. W. Moscrip	4,140	G. Wimpey & Co.	3,727
C. Gray	4,100	F. G. Minter	3,698
T. Bendon	4,079	B. E. Nightingale	3,697
Martin, Wells & Co., Ltd.	4,050	T. H. Kingerlee & Sons, Oxford	3,682
G. Lyford	4,043	J. Dorey & Co., Ltd.	3,679
H. Windsor & Co.	3,990	H. Wilcock & Co., Wolverhampton	3,580
J. C. Richards & Co.	3,977		
J. Chessum & Sons	3,975		

* Accepted.

[Rest of London.]

LONDON, W.—For the erection of boundary walls to enclose the site of the proposed new board room and clerk's offices, receiving house for children, and out-relief department at Goldhawk Road, Shepherd's Bush, for the Hammersmith Board of Guardians. Mr. J. H. Richardson, architect, 37 Finsbury Pavement, E.C.—

A. R. Bulley	£1,522	J. Chessum & Sons	£1,310
G. Lyford	1,511	Foster Bros.	1,280
J. Barker & Co.	1,496	M. Lascelles & Co.	1,270
J. Mears	1,475	H. J. Greenham	1,275
E. A. Roome & Co.	1,450	F. G. Minter	1,275
J. Dolman & Co.	1,415	G. Wimpey & Co., The Grove	1,251
Martin, Wells & Co.	1,399	Hammersmith	1,251
T. Bendon	1,399	J. McManus	1,248
Hibberd Bros., Ltd.	1,360	J. C. Richards & Co.	1,235
T. H. Kingerlee & Sons, Oxford	1,334	B. E. Nightingale	1,225
H. Windsor & Co.	1,333	Watts, Johnson & Co.	1,217
S. W. Moscrip	1,329	Viney & Stone	1,197
		C. Gray	1,150

* Accepted.

[Rest of London.]

MANCHESTER.—For the erection of wards for the treatment of patients suffering from tuberculosis at their workhouse, Mansfield, for the Guardians. Messrs. Vallance and Westwick, architects, White Hart Chambers, Mansfield.—

J. Greenwood	£1,000 0
S. B. Frisby	1,000 0
Vallance & Blythe	1,345 0
J. Fisher	1,307 0
J. & F. L. Parsons	1,418 10
G. R. Randall	1,400 0
W. A. Vallance	1,300 0

* Accepted.

[All of Mansfield.]

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COMING EVENTS.

Wednesday, May 28.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Professor J. Logan Lobley on "The Haslemere Congress of the S.E. Union of Science Societies," 7.30 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

CHURCH CRAFTS LEAGUE.—Meeting at the Church House, Dean's Yard, Westminster, S.W. Discussion on "The Origin and Symbolism of Church Ornaments," 8 p.m.

Thursday, May 29.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

CIVIL AND MECHANICAL ENGINEERS SOCIETY.—Annual Dinner at Frascati's Restaurant, 7.30 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Miss Ethel Halsey on "Rimini under the Malatestas," 8 p.m.

HOME ARTS AND INDUSTRIES EXHIBITION.—Opens in the Gallery of the Royal Albert Hall. Remains open till June 2nd.

ROYAL INSTITUTION.—Mr. M. H. Spielmann on "Contemporary British Sculpture"—II, 3 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (Dublin Section).—Mr. Marshall Osborne on "The Lighting and Driving of Textile Mills by Electricity." Annual General Meeting, 8 p.m.

Friday, May 30.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

INSTITUTION OF MINING ENGINEERS.—General Meeting at Burlington House at 10.30 a.m.

ROYAL INSTITUTION.—Mr. G. Marconi on "The Progress of Electric Space Telegraphy," 9 p.m.

Saturday, May 31.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Stirling Church and Castle.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Durham.

Monday, June 2.

SOCIETY OF ENGINEERS.—Ordinary Meeting at 7.30 p.m.

Tuesday, June 3.

ARCHITECTURAL ASSOCIATION.—Annual Soirée (Dress Rehearsal, Ladies' Night) at St. George's Hall, Langham Place, W., at 8 p.m. A musical play will be performed entitled "Arctia: A Legend of the Far North," written by Mr. Gervase Bailey; music composed by Mr. Leonard Butler.

Wednesday, June 4.

BRITISH ARCHEOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

ARCHITECTURAL ASSOCIATION.—Annual Soirée at St. George's Hall, Langham Place, W., at 8 p.m. A musical play will be performed entitled "Arctia: A Legend of the Far North," written by Mr. Gervase Bailey; music composed by Mr. Leonard Butler.

Thursday, June 5.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m. Ballot for the election of Fellows.

ROYAL INSTITUTION.—Mr. M. H. Spielmann on "Contemporary British Sculpture"—III, 3 p.m.

Friday, June 6.

ROYAL INSTITUTION.—Sir Benjamin Baker on "The Nile Reservoir and Dams," 9 p.m.

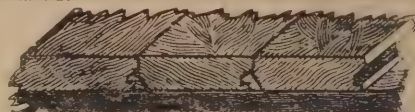
Saturday, June 7.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

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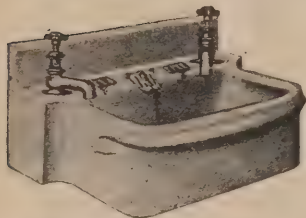
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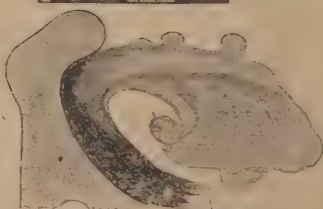
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The Consequent to Peace. Now that peace has been concluded, many members of the architectural profession, dissatisfied with openings here, will think of South Africa as a new field for their energies. Let them not be too hasty. It will be many months before the country in any way begins to settle down. When the great building revival is well advanced there will doubtless be much work in prospect for architects; but it must not be forgotten that the profession is already well represented on the spot by men who are familiar with the local needs, and who are quite capable of supplying all the requirements of the moment. Cape Town is very well furnished with architects. The building boom seems to have begun in Johannesburg and master-builders in the south bitterly complain of the dearth of skilled labour, caused by the men leaving in great numbers. So the maxim for the present is—if you are a skilled craftsman in need of work, go to South Africa; if an architect, wait.

A Football Match. PARTICULARS have just come to hand, though considerably belated, of a football match which was played in the latter part of the season between two well-known architectural societies. The occasion was unique, both in respect of the play itself and of the elaborate arrangements made. The game was played according to Rugby rules, though this was not simply a matter of individual preference, but the result of a long and heated controversy. Many of the players contended that Gothic had long since ceased to be a living art; and though there was no direct evidence of the prelate-builders having played football, it would undoubtedly be a mistake to mimic their works by using a ball having pointed ends. What was required was one expressive of its purpose and embodying the spirit of the age in which it was built. So that these exponents were for a new design altogether, constructed of local materials and showing the marks of the tools by which it was wrought. Other players, however, who had no liking either for an ultra-modern treatment of the football, much less for the inanimate Gothic shape that still passed current, strongly advocated the Association game, by which they secured a sphere emblematic of all that was noble in Classic architecture, a goodly ball, a ball of studied proportions, and one moreover with all its internal arrangements expressed boldly on the exterior. So the discussion raged, but in the end the Gothicists succeeded, there being many church architects among the players. Brown, the well-known representative of the modern school, kicked off

for the home side, and Brown's brother, taking a damp-course, returned well to touch. From a throw-out, which was in good alignment and well led, Brown's cousin secured the ball and with a pre-Gothic twist of his ankle blossomed forth at the head of his column in a capital way, friezing all around him, and carrying the play well within his opponents' twenty-five. Here a scrimmage took place. The home forwards egged well and their half-back darted out in a very ornamental manner, vaulted over the opposing half-back, and, acting up to his ancient lights, gave a grand Decorated pass to the left-centre threequarter, Brown's nephew. The latter made a fine run and was well on his way to the king-post when he was underpinned by James. He managed, however, to throw out the ball, but it was intertransepted, and play was carried into the home half. Here Bate, in his

vociferous cheers. In doing so, however, he was injured and had to be carried off the ground: some said he only chamfered pain and they expressed themselves in a manner which gratefully jarrahed on the nerves of the visitors' supporters. The injury happily proved to be slight and Arris returned amidst loud applause, which he took navelly enough. Play was resumed in earnest and the sight was one for the gods to con-temple, the match-boarding on the sublime. Jinks, the home back, gave a splendid kick which found touch well within the opposite twenty-five. At this the crowd rejoist, there being many stanchion true sportsmen among them. After a close scrimmage, during which the ball was rough-cast many times, the home three-quarters at last had their chance. From man to man the leather passed and finally reached the wing, who, kerbing



FLATS WITH STUDIOS, LANSDOWNE ROAD, NOTTING HILL, LONDON, W.

best stylo, got possession, and set-off for the line in o-rielly amazing manner, running through the visiting team like a lightning conductor. He dodged the back and so overcame the last impediment, scoring between the posts. The kick was successful, despite the ball being pilastered with mud, and thus the home side were a goal to the good. During the remainder of the first half nothing very noticeable happened, scrimmages being frequent owing to the weak bond, which was all headers, though plenty of stretchers were on the field. After half time the game became fast and furious. The visitors were now on their art-metal, and were well primed-up. Their wing-threequarter Arris secured a splendid opening through the muddling of the home forwards and flue up the field, sweeping round the full-back and scoring amid

himself, made a plumb-line for the goal. Such a chance sill-dom comes and he made the most of it, scoring in Romanesque style. The kick, however, failed. Full-time was now drawing near and the visitors made frantic efforts to score. Doricly they secured the ball their forwards led the way: they played batter and batter and eventually Saintpauls crypt along, stouped, and crossed the line. This was a-purlin enough, but when the ball passed well over the bar the home team began to feel anxious, while their opponents, whose hope of victory had varnished, played with increased vigour. They failed, however, to add to their score, though, when the whistle blew, the game was dangerously near their opponents' line. Things had been allowed to go tufa and thus the match ended in a win for the home team.

RECENT STREET ARCHITECTURE IN LONDON.—III.

BY F. HERBERT MANSFORD.

(Continued from p. 120, No. 375.)

IT is strange that the neighbourhood of Park Lane should have passed through the period of the Gothic revival almost unaffected, and then in these days have been graced by such buildings as the mansion opposite Stanhope Gate and the block overlooking Mr. Beit's garden. Truly this latter does not represent the Gothic of the Middle Ages or even that of thirty years ago; it is rather the Gothic of the Astor House on the Embankment; here, as there, we find egg-and-tongue ornament, a reminiscence of the triglyph in a frieze, and Classic columns to the porches. Neither can one describe the delicate iron area and balcony railings as Gothic. But these small details, and even the strongly-marked horizontal lines of moulding and colour, do not detract much from the intrinsic Gothic character of the design. There are six houses in the block, but the party walls above the roofs are absorbed by chimneys or skilfully treated as buttresses to the stacks. The walls behind the gables must be nearly built of flues, and present an ungainly appearance from certain points of view. The cornices of the bays are a little overcrowded with enrichments, but the whole group, taken in conjunction with Mr. Beit's house and garden (of which Messrs. Balfour & Turner were the architects), forms one of the most delightful bits of colour on the outskirts of the Park. The arrangement of the ground-floor windows on the west elevation is worth attention. The upper range of lights occupies the full width of the façade, thus allowing the maximum view of sky and admittance of sunshine. Only in the centre are there lower lights to give a view on to the pavement, so that as much privacy is obtained as possible. Mr. A. H. Kersey was the architect of this terrace.

Near by, a spacious stable-court or mews forms an agreeable break among lofty mansions. Stone is freely used, with bold simplicity, mouldings being almost confined to the cornices. It is as if the design were produced by the clever use of a child's box of bricks rather than with pencil and rubber, or perhaps as if rubber were freely used on the drawing until all but essential outlines were eliminated. The result, however, is effective and reposeful and, like all Messrs. Balfour & Turner's work, not without a certain suggestive freshness.

Lord Ribblesdale's mansion in Green Street, Park Lane, by Mr. Sidney R. J. Smith, F.R.I.B.A., is more imposing and more distinctly Georgian

than Lord Windsor's recently built house in Mount Street (Mr. Fairfax Wade, architect). Add a frieze to the entablature, omit the segmental bay, modify the iron railings, and the resemblance to a plate in Messrs. Belcher & Macartney's "Later Renaissance" is complete—not to any particular plate be it observed, but in true Georgian spirit to many of them. Whether this is praise or mild censure can only be determined by those who know the intention of the client. The south elevation appears well nigh perfect in its air of distinction and repose. The rainwater pipes are judiciously placed so as to suggest a grouping of windows; perhaps if internal considerations permitted, it would have been better had there been a slight extra width of brickwork between the end windows, when the stack pipes would have seemed to have formed an element in the design from the first. Perhaps, too, the entrance porch is small in detail, but in the face of such evident mastery one does not feel sure.

In South Street, next to the St. George's Schools, is a block of five houses so broken up, however, in elevation as to suggest rather the effect of detached and semi-detached residences. A well-designed balustrade binds them all together, but above and below many small differences give marked individuality to each group. The steep hipped roofs and the somewhat unnecessary pilasters besides the windows of the centre houses inevitably recall the French homes of the time of Francis I., but in the loftier elevation towards the St. George's Garden Mr. J. J. Stevenson shows us no trace of Continental influence.



BLOCK OF HOUSES IN PARK STREET, W.
A. H. KERSEY, F.R.I.B.A., ARCHITECT.

There is also a slight flavour of the French Renaissance in the façades of the Imperial Club at the corner of Clarges Street and Piccadilly. This building is faced with finely-jointed red rubbers and stone dressings, and roofed with green slates. The angle bay is unusually large, and must be of great internal value in such a situation. The stone mullions are in many cases enriched with arabesque panels delicately carved. It is not obvious why the stone frieze is not continued on the Clarges Street elevation, unless it be that the windows would have broken through it, but it is missed at present, while the building is still clean and colour seems of more value than form. The enriched external gutter carrying the rainwater from the balcony of the bay to the stack pipe shows how a generally undesirable feature can, when essential, be successfully treated. A more serious difficulty probably presented itself in the fact that only the eastern portion of the building contains a mezzanine floor. Yet it was evidently not considered desirable to emphasize the fact to the destruction of the simplicity of the fenestration. The principal windows, therefore, are divided into three tiers by transoms at such levels that where the mezzanine occurs the centre tier is built in solid with masonry, the upper transom becoming a convenient sill.

Messrs. Wimperis & East's elevation to the Empress Club in Dover Street is noteworthy, also that of the stone-fronted mansion, No. 12, Berkeley Street.

At the south end of Park Lane is a block of flats nearing completion. The front elevation is largely occupied by three series of bay windows connected by stone balconies at different levels which give a rather disjointed appearance to the façade, but ensure that each flat has one of these necessary adjuncts. The porch is supported by six columns of fine purple marble, and its uncomfortable connection with the main wall is accounted for by a necessary modification of the design after the commencement of the work.

Passing the appalling blocks of flats which are turning Knightsbridge into a draughty passage, and noting the more agreeable but equally lofty mansions above Harrod's Stores, we emerge once more into the sunshine of Park side and so to Kensington. Two or three fussy



DETAIL OF HOUSES IN PARK STREET, W.

terra-cotta structures in the High Street cause one to turn gratefully towards Philip Webb's masterly and reposeful house at the end of Kensington Palace Gardens. Messrs. Slater & Co.'s premises show a touch of the "Art Nouveau" in the swirling lines sunk into the soft red bricks; it would have been more consistent, perhaps, to have carried the treatment over the façade instead of reverting to foliage in relief.

The architects of Campden House Chambers have shown a method of treating a large block of flats with style and economy. The building is disposed in agreeable masses, based presumably on convenience of plan, a pleasing skyline obtained by careful consideration of roofs, then freshness and interest added by unusual handling of brickwork to window-jambs and cornice. The small amount of masonry is confined to the alternately deep and shallow courses of the ground-floor walling, and to the arcaded entrance, which affords a necessary porch and gives dignity to the whole block. Porch and balustrade excepted, there is nothing of what is usually understood as ornament; yet one instinctively recognises the impress of Messrs. Balfour & Turner.

Another block of flats rears itself boldly at the south end of Lansdowne Road, W. Owing to the fact that these are designed for artists, and every two-floor suite contains a studio the height of both, the monotonous repetition of small windows is avoided. The boldly corbelled balconies faced with slabs of stone stood on edge and cramped together give a striking aspect to two of the elevations.

Between Holland Park and Hammersmith Broadway there is little recent work to interest us on artistic grounds. There are few more delightful thoroughfares in London than Melbury Road, but nothing has been erected there very lately. May it long remain intact with its houses by Shaw, Burgess, Belcher and Ricardo, its homes of painters, sculptors and architects.

Behind Olympia is rising the new building of the Savings Bank Department, which promises to be the greatest artistic failure that the Office of Works have created since the completion of the Bankruptcy Courts. One would have thought that at this distance from the City the nation could have afforded an effective if not a commanding site. This structure, however, is divided from the main road by the factory and stables of a well-known catering firm, and is surrounded by mean streets of monotonous houses with which it is in perfect harmony. It is unfortunate that when the plans, the outline of elevation and approximate sizes of windows were determined, some outside architect of repute was not consulted as to the treatment. A man like Mr. Norman Shaw could have given style to such a building without any extra cost being involved. We must now hope that the surrounding ground will be well planted. Virginia creeper covers a multitude of architectural sins.

On the south side of the Hammersmith Road and east of the St. Paul's Schools are two new rows of "mansions." Fitz-George and Fitz-James Avenues are avenues in more than name, being planted with trees on both sides, and the vista eastwards is at present terminated by a noble group of elms. The blocks are varied in elevation and plan, so that much of the usual oppressiveness and monotony of flats is avoided, but there is little more to be said about the architectural treatment.

(To be continued.)

An Electricity Generating Station in Manchester has been opened in Stuart Street. The station covers an area of 8½ acres. Within the building there are to be two installations—the present installation of 15,000 horse-power, devised by Dr. Kennedy, and a second installation of 12,000 horse-power, in accordance with a scheme of extension prepared by Mr. G. F. Metzger after his appointment as chief engineer in 1901. The buildings consist of a steel framework, filled in with walls of brickwork. The boiler-house, pump-room and engine-house are all on an extensive scale. Workshops will be provided in a separate building, above which will be placed a large storage feed tank. In connection with this scheme ten sub-stations are being erected upon the south side of the city.

THE ELECTRIC LIGHTING OF ST. PAUL'S CATHEDRAL.

THE electric lighting of St. Paul's, which has been in progress for upwards of three years, has now reached a stage of partial completion, and was used for the first time generally throughout the chancel, dome, nave and crypts at Whitsuntide. The installation, which has cost nearly £10,000 so far, is a generous gift to the Dean and Chapter from Mr. Pierpont Morgan. The difficulties of wiring and lighting so immense a building are considerable, as, apart from the care necessary in piercing thick stone walls and floors, now 200 years old, the distances to be traversed are very great, and the basement is a network of tombs and vaults, which have to be avoided. The work has been carried out in an admirable manner by Messrs. W. A. S.

crypt has been lighted throughout with the old gas fittings in the shape of hanging Roman lamps, which have been adapted to electric light. The same adaptation has been made in the case of the Pegram and nave standards, the bases and pillars of which remain as before, the heads, carrying electric lights in basin-shaped glasses, alone being designed afresh. These glass bowls transmit a beautiful quality of light, and were the result of many experiments on the part of Mr. Benson. The choir aisles, the entrances, the consistory court, the whispering gallery, and several other points in the church, have yet to be lighted or provided with their permanent fittings. A few of the large pendants in the dome and transepts have their places at present filled by temporary but solid-looking structures of wood and iron. These, together with the arduous work of channelling and piercing the stone walls to receive the steel



HOUSES IN SOUTH STREET, MAYFAIR, W. J. J. STEVENSON, ARCHITECT.

Benson & Co., of New Bond Street, the well-known electricians and art-metal workers, under the superintendence of Mr. Somers Clarke, F.S.A., the consulting architect to the cathedral, and Professor Kennedy, the consulting electrical engineer. The fittings, which were designed by Mr. Clarke and cast by Messrs. Benson, consist of six large pendants of cast and gilded brass in the choir, hanging from the vault, which, in addition to lighting the floor, throw a glow on the mosaics of the vault by means of upturned lights concealed in cups. There are also eight heavy bronze pendants under the dome, and two others in the transepts; four gilt bracket lights upon the chancel screens; and a ten-light fitting in the apse, which also lights the Jesus Chapel. The five tall standards in the nave and two at the west entrance were designed by Mr. Penrose and Mr. Pegram respectively. In addition to these, the choir desks have been fitted with standards holding concealed lights and the

tubing in which the wires are carried, must be credited to the cathedral's own staff of workmen, under the clerk of the works, Mr. Harding. The switching arrangements for the lights are necessarily complicated, and require the use of large switchboards, one of which can be seen in the crypt. The others are in a locked chamber off the staircase in one of the main piers of the building. Current is supplied by two different companies, and in each case from more than one station, to minimise the risks of breakdown. As evidence of the care devoted to this point, the lights are fixed alternately on different circuits right through the church. It is computed that 16 miles of cable, containing more than 2½ tons of copper, have been used in the installation. There is still a gloom overhanging the western end, but this will be effectually dispelled by electroliers which are shortly to be suspended from the roof. Even in its present incomplete state the total illumin-



BALFOUR MEWS, W. BALFOUR AND TURNER, ARCHITECTS.

ating power obtained is at least 20 per cent. more than what has hitherto been given by gas: besides which the damaging effect on the decorations will be remedied.

Mr. Pierpont Morgan has seen the marked improvement already accomplished, and is so well pleased with the result that he has undertaken to bear the cost of carrying the whole plan to completion. Fully twelve months will be required for that purpose.

LEYTON PUBLIC BATHS.

THE new public baths which have been erected for the Leyton Urban District Council were designed by Messrs. Harrap & Duffield, of London, whose plans were selected in a competition held in 1898, Mr. Rowland Plumbe, F.R.I.B.A., being the assessor.

On the ground floor are two swimming-baths. The hall for the first-class bath is 116ft. long by 46ft. wide, the walls being lined with a dado in coloured glazed brick with white bricks above. Sixty-five dressing-boxes and two shower-baths are provided, with a gallery on three sides. This bath is in direct communication with three club-rooms, for the use of swimming clubs using the bath. There are also lavatories. The pond measures 100ft. by 30ft., with a depth varying from 3ft. 6in. to 6ft. 6in.; its capacity is about 90,000 gals. The second-class bath is somewhat smaller, being 80ft. by 30ft., with a depth similar to that of the first-class bath, and a capacity of 70,000 gals. The ponds in each case are constructed of concrete and lined with white glazed bricks. The roofs are constructed with iron principals, boarded and slated, and with glazed lantern lights. Three first-class and eight second-class slipper-baths are provided for ladies, and six first-class and fourteen second-class baths for gentlemen.

On the ground floor is also arranged a laundry fitted with a complete system of machinery for washing and drying the towels and garments. The laundry machinery has been supplied and erected by Messrs. W. Williamson & Co., of Hackney. In the rear is placed a boiler-house containing two Lancashire boilers, each 30ft. long by 7ft. diameter, together with a coal store and stoke-hole. The boilers, tanks, steam- and water-pipe systems, and the consulting engineer's unique swimming-pond circulation systems, have been carried out by Messrs. Fraser & Fraser, of Bromley-by-Bow. Behind the boilers is a Green's fuel economiser, through which the heated gases and smoke have to pass, thus preventing all undue waste in fuel and heat on their way to the chimney shaft. In the rear of the boiler-

house is arranged the engine-room and engineer's repairing shop, in the former of which is placed the engine to drive the well-pumps and laundry machinery. In this room is also constructed a well from which the baths will be supplied with water. The well is 110ft. deep and 9ft. diameter to a distance of 40ft. deep and 8ft. diameter below. A borehole is carried down a further 105ft. into the chalk. The well is lined with cast-iron cylinders, and is capable of storing 15,000 gals. up to the water line. In the well is placed a set of three-throw pumps, capable of raising 20,000 gals. per hour to a large storage tank in the roof, containing about 15,000 gals., from which the supply to the baths is drawn. The contract for the well was executed by Messrs. S. F. Baker & Sons, of Southwark, and the contract for the engine and pumps was entrusted to Messrs. Goddard, Massey & Warner, of Nottingham. On the first floor are arranged a board-room and superintendent's room, with access to the gallery around the first-class swimming-bath; and in the basement gangways are arranged around both swimming-baths for easy access to the supply and waste pipes, and large stores are also provided. As the first-class swimming-bath will in the winter months most likely be used as a public hall, for the purposes of meetings, concerts, dances, &c., special accommodation has been provided by the architects

for this purpose; and the club-rooms previously mentioned will be used for artistes' rooms, with a separate entrance, while an entirely different entrance is provided during the time the hall is in use for the purpose of access to the gallery and hall. The dressing-boxes have been arranged by the architects on a novel system of their own, so that they can be folded back against the wall and the bath floored over when required.

Special care has been taken with the heating and ventilation of the buildings throughout by means of radiators conveniently situated, while the water in the baths is heated by steam. Each swimming-bath is ventilated by means of Blackman air-propellers, ensuring a constant change of air, which is admitted through air-ducts in the wall and delivered above the dressing-boxes. Externally the buildings are faced with red bricks with Ancaster stone dressings and slate roofs, and the contract was let to Mr. Coxhead, of Leytonstone. The building is lighted throughout by electricity, and the contract has been carried out by Messrs. Eben Ryan & Co., of Leyton, under the superintendence of Mr. J. Hewett, B.A., A.M.I.E.E., who is associated with Messrs. Harrap & Duffield.



CAMPDEN HOUSE CHAMBERS, SHEFFIELD TERRACE, W. BALFOUR AND TURNER, ARCHITECTS.

THE SHELL IN ARCHITECTURE.

Some Interesting Facts and Resemblances.

ABOUT twelve years ago Mr. T. A. Cook was dining at Oxford in company with some distinguished biologists, when he produced for general inspection a proof engraving of a certain staircase built by an unknown architect of the early sixteenth century in Touraine. One of the party loudly proclaimed his recognition of the spiral curve therein depicted. No sympathy, however, was suggested with the architectural problem so triumphantly surmounted; and the critic who now held the picture of the spiral staircase in his hand announced to his comrades that the curve was identical with that of *Voluta resperitio*. Abashed, befogged, yet keenly interested, the unlearned visitor hinted at his utter ignorance of what *Voluta* might be. "The curve of the architect's spiral," he was told, "is the same as that in the interior of a shell."

Voluta was promptly fetched. Still the visitor remained unmoved and unilluminated. But the professor had pity on him. A sharp saw was produced, a longitudinal median incision was made, and the spiral stood revealed within. Though Mr. Cook knew little history, less architecture, scarcely any mathematics, and no morphology or botany whatever, he became irresistibly impelled to enter upon a course of theoretical enquiry which involved a deep mastery of all five. In the course of the investigations embodied in the essay which appeared in a recent issue of the "Monthly Review," already briefly referred to in these columns, a *Scala della Conchiglia* (or "shell staircase") came to light in Italy, and a *Voluta scalaris*, a *Solarium maximum*, even a *Scaloria scalaris* (or "staircase shell"), in the Natural History Museum at South Kensington. The questions to which he sought an intelligible reply have not yet been answered in any of the five divisions of intellectual research, though distinguished exponents of each are firmly convinced that a reply can be furnished by the others. He does not give the names of many who have most kindly afforded him assistance.

In the course of his essay Mr. Cook says:—No one has yet been able to say who designed the open staircase in the wing of Francis I. at Blois, the main impression of which is its spiral form.

The beautiful effect obtained in what is known as the "Prentice Pillar" in Rosslyn Chapel is due to the fact that its separate right-handed spirals (proceeding from their separate points) envelop in their long and slender ascending curves a pillar which is artfully grooved in perpendicular lines so that full value may be given to the encircling decoration. In Nature the ascending curves of spiral growth are nearly always, like these, towards the right.

In these military days it is also possible to point to a sinistral spiral which has become a common object of admiration, and that is the rifling in a Lee-Metford, which is made to turn to the left in order to counteract the pull of the average right-handed soldier. It is curious that all left-handed spirals look as if they were at almost double the pitch of the corresponding right-handed spirals: perhaps because they are less familiar to the eye.

The difference between such dextral and sinistral spirals as we have now seen artificially constructed, "from the outside," becomes more and more suggestive when we investigate a few examples of spiral growth "from within," in plants and other natural objects; and we shall find that when objects which usually display a dextral helix are found to show a sinistral helix, some peculiar value and often some supernatural signification is attached to them by the primitive races who make the first discovery. The delight in such rarities of Nature, and the instinctive use of them as ornament, was shown by Schliemann to be at least as old as ancient Troy; for he found that an inland people had used the echinus or sea-urchin as a model for the bosses which they set round the circle of their shields.

The use of the spiral in ornament goes back to prehistoric times in other instances. In the work of the Bronze Age flat spirals are found hanging to the side of a shield as decorations, just as on an ancient pile-hut-urn (which is mentioned in Sir John Lubbock's "Prehistoric Times," and is thought to come from Melos) the walls of the house are represented as being decorated with large spirals. From the well-known fact that the medieval monks used to say their prayers within a maze, to escape the pursuit of the Devil, there may, perhaps, be more in the form of the famous Labyrinth at Crete than has yet been suggested, and the spirals tattooed upon a Maori's face may have the same object of confusing the Evil One.

The shape of the shavings at a carpenter's bench might furnish another Sherlock Holmes with the proof he required that his murderous mechanic was either left-handed or a Japanese; for one of these two he must have been if the shavings exhibit a sinistral spiral. The right-handed screw which is usual in the innocent shavings is produced because the right-handed carpenter invariably drives his plane a little to the left. Orientals seem always to prefer a left-handed spiral, just as they write from right to left.

No one who looks with a seeing eye at the finest of the buildings which Leonardo da Vinci might have known can fail to detect an intense perception of that harmony in relation to quantities of which Nature is the great exemplar. The "straight lines" of the Parthenon are in reality subtle curves, and recent investigation has detected a similar delicacy of constructive measurement in the great Gothic cathedrals. The influence of the study of flowers and leaves is especially marked when the positions and proportions of the best Byzantine arches are examined in the light of the laws which govern growth.

In such a shell as *Solarium maximum* the simpler form of spiral arrangement is prettily exemplified, and it is so easy to imagine walking in at the mouth (or entrance) and continually turning to the left until the top is reached, that this shell has been commonly called the "staircase shell." A connection between shells and spiral staircases has been indicated in the words "leiotropic" and "dextrotropic," which are otherwise inexplicably the reverse of the spirals they describe. But it is still further suggested by the nomenclature of some well-known architectural treasures in Italy. At Fiesole, for example, in the convent of San Domenico, there is a flight of eight steps leading down to the cloister which is so exquisitely arranged in the form of a shell that the little building is called the "Scala della Conchiglia." There is a Venetian staircase (at San Paternian) in the Palazzo Contarini, which is called the Scala del Bovolo, and I am tempted to think that the architect of this dextral helix, with its exquisite rising spiral of light archways, may have seen the shell so aptly called *Scaluria scalaris*, which exhibits exactly the same formation. In this shell the mouth or entrance has gradually grown round and round with the growth of the inhabitant, leaving

a little colonnette behind it as it moved, until it reached the place which is equivalent to the door in the staircase to which I compare the shell. How infinitely more beautiful the spiral formation of ascending curves in the Scala del Bovolo is than a mere system of superimposed circles (even when arches and colonnettes are similarly added) may be seen from a comparison of the whole height of this staircase with the Campanile at Pisa. But the spiral formation itself is not invariably a happy thought in every architectural position. Some such idea of growth, of support, of strength, as shown in the "Prentice Pillar," seems as essential to it in Art as in Nature. The staircase of the Rundthor at Copenhagen is, for instance, a far more satisfactory example than the twisted copper spire in the same locality; or than the stone spirals in one of the small steeples of the palais de justice at Rouen, near the Rue Jeanne d'Arc; or than the twisted screw-spire at Chesterfield. Mere imitation of externals, without structural necessity, is, in fact, as barren here as it must ever be. Perhaps this is why I can never admire the twisted chimneys so often seen in Tudor buildings. Even when in its right place, in a staircase, the spiral needs clever handling if it is to be effective, as may be seen in the clumsiness of the brickwork in the house of Tristan l'Hermite at Tours, and the ambitious failure of the clustered sinistral spiral in the stone stairway of the cloisters in the same town. In each case the steps, too, are straight and inartistic.

An even more delightful example of the close connection between a good architect's plans and the exquisite lines of Nature is to be found in the stairway called "Escalier de la Reine Berthe" at Chartres. It exhibits the delicate exterior ascending dextral helix, and even the top of *Mitra papalis*, with extraordinary faithfulness, and the parallel becomes even more complete when the position of the darkened doorway is compared to that of the shadowy orifice of the shell. In *Mitra papalis* at this orifice the beginnings of three internal spiral lines which suggest that the internal arrangements of a shell have as much to teach us as its exterior forms; and a very beautiful spiral may be seen by the aid of the X-rays continuing throughout the whole length of the long-pointed shells so common in the south. The clue is worth following up, and a section cut through such a shell as *Telescopium telescopium* actually reveals an exquisitely firm and elegant single spiral (a dextral helix) rising round the columella, that pillar which supports the whole, and this at once reminds me of the spiral in a staircase built in the old part of the Château of Blois many years before Leonardo was in France. But I do not for a moment suggest that there was any conscious comparison in the mind of the fifteenth-century architect, and this for the very good reason that the curve of his stairway and the beautiful spiral rail (on which the left hand would rest as one ascended) are both susceptible of a simple architectural explanation; so that all I should be inclined to say of this comparison at present that as the lines of the architecture are right and fulfil their purpose exactly, with an economy of space and strength and a sufficiency of support, they were therefore very likely to be in harmony with those lines which Nature, the best of all artificers, has developed in her shell. I should need more resemblances than this to be satisfied that one might have been taken from the other; but, on the other hand, I shall by no means reject such a possibility, at the outset, as absurd; for architecture is full of such copies from Nature, as every organically beautiful, constructive art must be; and it is full of equally suggestive relics of the simpler forms of shelter from which the palace slowly grew. If



"HUDSON HOUSE," PARK LANE, W.

the Egyptian pillar is a copy of the lotus-plant, so the peculiar shape of the Moorish and Saracen arch is a survival of that wind-blown tent, with conical top and bagging sides pegged closely in, which was the habitation of the Bedouin.

MR. SPIELMANN ON MODERN BRITISH SCULPTORS.

IN his second lecture on Contemporary British Sculptors, delivered at the Royal Institution on Thursday last, Mr. M. H. Spielmann said the beginnings of sculpture were easier than any other art, and its endings more difficult. While almost anyone could mould pliant clay into the copy of a man, few could conceive and embody an elevated idea not in mere imitation of a model, but by the fine treatment of form and the noble character of expression and design. Colour in sculpture was next dealt with, and it was pointed out how the nearer colour is to becoming imitative, the nearer it is to realism, and the more it departs from the poetic conception, while the use of various coloured marbles, jewels, and the like, though very delightful, once more detracts from the dignity of true sculpture, and makes it an "object of art."

The lecturer then dealt with taste, and referred to modern Italian sculpture as seen at Genoa and elsewhere as a lamentable instance of bad taste in that particular section of art, "funerary" art. This led to the consideration of triviality of idea, especially in the unintelligent use of ornament. This was an error, said Mr. Spielmann, returning to the sculptors of England, into which Mr. Stirling Lee had never fallen—he was beyond all others a sculptor's sculptor. Animal work by Mr. Swan and Mr. Harry Dixon was illustrated, and the ideal work of Mr. A. Lucchesi, concerning itself chiefly with the nude figure, was set forth. Considerable time was devoted to the works and to the genius and artistic character of Mr. Alfred Gilbert. All his principal works, with few exceptions, were shown one after another, the characteristics of each commented on, and an attempt was made to differentiate Mr. Gilbert's dual talent, that of sculpture and that of goldsmithery. The lecturer remarked that Mr. Gilbert was, perhaps, the most wonderful example of the creative genius, at once sculptor and artificer,

since the time of Cellini; and when we remembered that to England that produced him were also due Flaxman, Alfred Stevens and Watts, we might well ask ourselves if form really was foreign to the temperament of this country, and if sculpture was really an exotic in the land.

Mr. Spielmann dealt with the recent revival in sculptors' hands of metal-work, cut, beaten and twisted, but remarked that, however fine in itself, it did not help forward sculpture, as it diverted attention from planes and light and shade to design and line, a beautiful and an elevated art, but not sculpture. He pointed out how, though horse trappings and the like were in real metal treated sculpturally in the Parthenon frieze, they were rendered, as time went on, in marble, as may be seen in the Pergamon frieze.

The next artists dealt with were Mr. Robert Stark, the animal sculptor, and Mr. Conrad Dressler, whose work is essentially decorative. Then the work of the late Mr. Harry Bates was placed before the audience—the well-known reliefs of "Homer," "Psyche," and "Endymion," the exquisite figure of "Pandora," the vigorous group of "Hounds in Leash," and the statues of the Maharajah of Mysore and Lord Roberts. This was succeeded by the work of Mr. George Frampton, who was described as one of the most versatile and most original artists of the day. Mr. Frith, the master of the Lambeth School, and pupil of Dalou, was represented by his monument to Wheatstone, and in the decorative and original standard lamps designed for Mr. Astor's office on the Thames Embankment. Mr. Pegram and Mr. Walker, one of the most rising sculptors of the day, were exemplified in their best known works, and the exquisite and sensitive art of Mr. Reynolds-Stephens charmed the spectators with its delicate invention, but he was treated rather as a goldsmith than as a sculptor.

Finally, there came the works of Mr. Alfred Drury, with their curious echo at the beginning of his master, M. Dalou, and the final emancipation when the sculptor's individuality was expressed in those charming and simple heads which have appealed even to the general public—"St. Agnes," "Griselda" and the "Age of Innocence." Mr. Spielmann then pointed out how the modern taste seemed to lean towards simplicity, as we have no longer any desire for the noisy emblematical groups such as injure the artistic aspect of Westminster Abbey and the Guildhall, and what Thackeray denounced as "braggart heathen allegories." But the lecturer claimed that it was rather a question of lack of opportunity that prevented our sculptors from dealing with the greater difficulties of more elaborate groups. He compared the state of sculpture at the present day with what it was sixty years ago, and told amusing anecdotes of the origin of some of our street sculpture which now defaced London. It appears that the equestrian statue of George III. in Cockspur Street was originally St. George and the Dragon, and that while the figure was robbed of its spear and given a cocked hat, and for its helmet were substituted wig and pigtail and Hessian boots—the dragon being removed—"the horse was left startled, as well it might be."

To-morrow's lecture will deal with all the younger sculptors of to-day, including Professor Lanteri, and will conclude with the powerful work of Mr. G. F. Watts, R.A.

Law Cases.

The Provision of Fire Escapes to London Houses.—At the Westminster Police Court Mr. W. Rose Rickards, the building owner of St. James's Park Mansions, Buckingham Gate, was recently summoned by the London County Council, under the Building Act of 1894, for failing to provide proper means of escape in case of fire at the above occupied mansions, let as flats, the height of which exceeded 60ft. The County Council approved the plans as far back as last November, and though every pressure had been put on the defendant nothing whatever had been done except the construction of a few doors. Mr. Biron said the defendant was in no way to blame for the delay. The engineers who had the ironwork in hand had failed to carry out the work during the time specified. Mr. Horace Smith said he would see what another £20 penalty would do, together with £3 3s. costs.

Workmen's Compensation: A Fresh Decision Affecting Scaffolding.—A case was heard at the Birmingham County Court on May 27th in which a painter named Dodson claimed damages for personal injuries sustained during his employment by the Horton Estates, Ltd., Birmingham. It appeared that Dodson was engaged in painting a shop front in Worcester Street, Wolverhampton, using for the purpose a ladder without planks. During the work he had occasion to cross from one window to another by way of the projecting front of the shop. This frail structure gave way, and he fell a distance of 12ft., fracturing one of his thighs. He therefore claimed compensation. His Honour, Judge Whitehorn, in giving judgment said it was plain that the building must be either in course of construction or repair, that this construction or repair must be conducted by means of scaffolding, and that the building so constructed or repaired must be 30ft. in height. As to the first point, the Supreme Court had decided that the operation of painting came within the Act as a means of repair. With regard to the second, the exact point was entirely new, and one had to search for some underlying principle in the, at first, contradictory decisions of the Superior Courts. The underlying principle seemed to be to take account of the manner in which the ladder was used. If it were merely in use as a kind of perpendicular roadway, to get from the bottom to the top of a building, it was clearly

outside the definition of scaffolding. But if, on the other hand, the ladder were used as a device or construction on which the workman stood whilst engaged in his work, the distinction was to his mind, clear, and rendered the various decisions perfectly intelligible. If one chose to use a ladder, or even a plank and buckets, in this way it became "scaffolding," and must be regarded as such in law. Coming to the third point, his Honour said he must hold that in this country at the present time fireplaces and chimney-stacks were regarded as essential parts of a house. This, of course, would bring the height of the house in question from the street line to more than the requisite 30ft. But, supposing he were wrong on this point, when they went lower and found an open cellar, lighted by a kind of sloping chute from the back yard, this again, according to the decision in *McGrath v. Neill*, brought the height up to 30ft. irrespective of the chimney-stack. On either basis, therefore, he held that the applicant was entitled to succeed. He had been earning £2 per week before the accident, and his Honour saw no reason why he should not be awarded the maximum weekly payment from October 17th last, namely, £1. Judgment was entered accordingly, the question of arrears being stayed by agreement for twenty-one days on the request of Mr. Arthur Smith who said that the decision was one creating new law, and that he would be bound to appeal.

Architects as Arbitrators: An Appeal Case.—The case of *Belcher v. the Roedean School Site and Buildings, Ltd., Brighton*, and in re an arbitration between the Roedean School Site and Buildings, Ltd., and Belcher and others, came before the Court of Appeal last week. The question which the court had to determine, broadly speaking, was whether the Roedean Company were entitled to enforce a certain award made under a building contract, and whether in the other case the plaintiff Belcher was entitled to proceed with an action in respect of matters which had been dealt with by the arbitrator on the subject of the award in question. It appeared that under a contract dated February 25th, 1897, Messrs. Peter Peters & Son, builders and contractors, entered into a contract with the defendant company for the construction of the Roedean school at Brighton, the amount of the contract being between £43,000 and £44,000. Under the arbitration clause all disputes were referred to Mr. J. W. Simpson, the architect. The work was to be completed by September 1st, 1898; but it was not satisfactorily proceeded with, and the builders became bankrupt on February 1st, 1899. The building owners gave notice determining the contract, took the work out of the builders' hands, and completed it under the superintendence of the architect. The works were completed on June 27th, 1901, and a final certificate was granted by the architect two years and five months after the notice taking the work out of the builders' hands had been given. By that certificate some hundreds of pounds were found due from the building owners to the builders. On July 1st, 1901, the solicitors for the trustees in bankruptcy of the builders wrote to the company stating that Messrs. Peter Peters & Sons had a claim against the company for damages for the improper determination of the contract. That point having been raised and there being other differences under the contract, the building owners requested the architect to undertake the arbitration. The persons represented at the arbitration were Mr. Davis, the plaintiff; Mr. Belcher, who had, with the consent of the building owners, advanced money to the builders on the security of the moneys payable under the contract, and certain other persons who had given the building owners notice of having a charge on the contract. Before the proceedings had advanced, Mr. Davis's solicitor served on the arbitrator an injunction granted on a summons restraining him from proceeding with the arbitration. That order, however, was afterwards reversed by the Court of Appeal. The arbitrator postponed the hearing of the arbitration for some time, and ultimately both Mr. Belcher and Mr. Davis protested against the arbitrator proceeding with the arbitration and declined to attend it. The arbitrator held the arbitration, and issued his award on April 9th, 1902, which found among other things a balance due from the builders to the company. On April 11th, 1902, he company took out a summons to enforce the award,



LORD RIBBLESDALE'S HOUSE, GREEN STREET, PARK LANE, W.
SIDNEY R. J. SMITH, F.R.I.B.A., ARCHITECT.

and on April 14th, 1902, Mr. Belcher issued a writ against the company claiming a declaration that the company had wrongfully taken possession of the site and had wrongfully determined the contract, and that the builders were therefore entitled to be paid on a quantum permit. The company then took out a summons seeking to stay the action. This summons was dismissed, and the company were not given leave to enforce the award. Counsel for the respondent said that the whole of the builders' difficulties were brought about by reason of the company not paying on the architect's certificates, on the ground that they had had notice of a charge on the moneys payable thereunder from some people called Cricklewood. The Master of the Rolls, in giving judgment, said it seemed obvious that all parties had consented to the arbitrator exercising jurisdiction to deal with the points which had arisen, and they could not now turn round and say that the award was a bad one, or that the arbitrator had exceeded his jurisdiction. He thought that the company should have leave to enforce the award, and that Mr. Belcher's action against the company should be stayed. The Lords Justices concurred, and the appeal was accordingly allowed, with costs.

Views & Reviews.

Land Surveying.

This, the second edition of Mr. Middleton's popular work on surveying has been entirely revised and considerably enlarged and now forms a most complete and useful text-book. The various methods of surveying and the instruments used are described and illustrated, both very clearly, and the new chapters on computing land areas, setting-out land and curves, and theodolite contour surveying will be found particularly helpful to students—these chapters appeared in our own columns about a year ago. Altogether the book is one we can recommend.

"Surveying and Surveying Instruments," by G. A. T. Middleton. Second edition. London: Whittaker & Co., 2, White Hart Street, Paternoster Square, E.C. Price 5s.

Lord Grimthorpe's St. Albans.

If ever a man had his fling of restoration, Lord Grimthorpe is that man. Architects do not love him, for he has made some very pungent remarks about them, so that mutual recriminations are the vogue. In this handbook, which is issued by the Homeland Association for the Encouragement of Touring in Great Britain, the author does not join in the controversy, but puts down the facts as gently as he can and gracefully avoids the thorny questions. The noble lord's restorations are so well known that it would serve no purpose to enlarge on them now; but it is well to recall a few things: how, for instance, the restoration of the Lady Chapel was carried out—"to those who knew it in its former ruinous condition . . . the change is certainly striking," as our author very circumspectly remarks. One does not forget, either, the rose window in the north transept; it most certainly has "evoked a whirlwind of criticism not always of a flattering character." There is also the inscription beneath it to the effect that "the building erected by Paul (the abbot) has stood for 800 years and still stands, renewed according to its ancient appearance. All the works of John, twice abbot, have perished, and Edmund is here as the new builder." "Edmund" is Lord Grimthorpe! Mr. Caröe, when lecturing recently before the Architectural Association on the preserving of ancient buildings, took occasion to refer to that "one-man school of destructive restoration, which is fortunately individual and unique—the brutal, ignorant, conceited, self-opinionated 'school' of Lord Grimthorpe." However, this has nothing to do with the author of this book, who gives his particulars clearly enough. The abbey, though one's attention is inevitably first drawn to it, is the subject of only a small portion of the book; the town itself, with its market-place, its grammar-school and ancient streets, forming the subject for the remainder of section 1. The second half of the book deals with the country around St. Albans, including many historic houses and churches. At the end are some notes for cyclists and a number of

particulars concerning the Hertfordshire County Museum. A map is also given.

"The City of St. Albans, its Abbey and its Surroundings," by Charles H. Ashdown, F.R.G.S., F.O.S. London: The Homeland Association, Ltd., 24, Bride Lane, Fleet Street, E.C. Price 2s. 6d. (cloth) and 1s. (paper) nett.

A Useful Estate Book.

The Country Gentlemen's Association has latterly been making very gratifying progress, and this year-book—the tenth and Coronation edition—is certainly most complete. It is full of useful information to anyone having any connection with country estates. The price at which it is published (3s. 6d.) is considerably below the cost of production, the intention being not to make a profit out of its sale but to further the interests of the Association. There are many articles of architectural interest. Some plans and elevations of entrance lodges, gamekeepers' and gardeners' houses are supplied by



ENTRANCE TO LORD RIBBLESDALE'S HOUSE.

Mr. Charles Carter, M.S.A., and some labourers' cottages by Mr. John M. Hotchkiss. Two short articles deal respectively with sun prints and estate maps; some notes on building timber are given by Mr. William Stevenson, and some on the building of stables and farmsteads by Mr. E. Sidney Wilson. Mr. Edmund R. Foley describes and illustrates the Home Farm buildings at Deepdene, Dorking. Mr. Joseph Lewis deals with lightning conductors, and Mr. Gerard J. G. Jensen, C.E., with the bacterial disposal of sewage from country houses; besides which a number of useful building memoranda and other notes are given. A list of the landed estate agents of the United Kingdom is also included, with particulars of the properties they manage. The book is well produced, being clearly printed on good paper.

"The Country Gentlemen's Estate Book, 1902," edited and compiled by William Broomhall. London: The Country Gentlemen's Association, Ltd., 16, Cockspur Street, Pall Mall, S.W.

The Annexe to Westminster Abbey.—Below the two western towers of the Abbey has arisen a seemingly old, stained and smoke-begrimed structure. It is massive in appearance and the mullions of its windows have a time-eaten aspect. 'Tis, however, an entirely new creation of lath and plaster—a most clever forgery. Here is the royal entrance, and in the structure will be the robing-rooms for their Majesties.

BRICKMAKING IN CUBA.

BUILT on the side of a hill, surrounded by mountains, lying at the head of an almost land-locked harbour, six miles from the ocean, Santiago presents a wondrous charm in its quaint architecture and barbaric colour effects, its old red moss-patched Spanish tile roofs, its blue or red or pink or green walls, with a dash of white here and there, all set against the varied greens of the hills. On landing, after crossing the Telfordised Alameda, one steps on a modern asphalt pavement, and after that to a red brick pavement—it is considered advisable to use the middle of the street instead of the pavement, as this varies from nothing to a width of 4ft. There is but little brick pavement, but quite a considerable quantity of asphalt, much to the discontent of the natives and old residents, who bitterly complain of the extreme heat radiation from asphalt: besides which the

moist atmosphere produces a certain slippery surface. The asphalt is clean and is kept clean, but the popular verdict is that it is not the pavement for Cuba. Bricks have not had a sufficiently extensive test yet to prove their superiority, but if clays or shales should be found on the island adapted to the manufacture of paving bricks, they will certainly have a fair trial; in fact, an experimental plant has been laid down, and the proprietors are working at different points on the island to prove possibilities. As a native industry, brickmaking—clayworking, rather—is almost, if not quite, alone. The cathedral at Santiago is built of home-made bricks much better in texture and better burnt than those made to-day, which cathedral is said to be 300 years old. The size of the brick is approximately 12in. by 6in. by 2in., and the same size is in use to-day. Now, however, crude, rough, irregular, warped and soft—all go in the building and are invariably plastered over with stucco, which, in turn, receives its coat of paint or coloured wash of such colour as may suit the æsthetic taste of owner or painter. Very naturally, it may be expected that when suitable face bricks are made in Cuba (and by "suitable" is not meant the trim, true, pretty-looking face brick that seems as if it had come from a planing machine, but a fairly regular, well-burned brick) then the day of stucco may pass. As may be inferred, the processes in vogue are of the simplest sort. There are the temper-

ing pit, the hand mould, the drying shed and the kilns; none evidencing much ingenuity unless it be the kiln, the Spanish horno. This is of beehive form and updraught, 8ft. or 10ft. in diameter, with a capacity of from seven to ten thousand bricks. The one fire-box, down below, is the full diameter of the kiln, arched over, having 4in. slits extending from one side to the other and 8½in. or 9in. apart. The floor, about 7ft. above the crown of the arch, is flat, and on this the bricks are set on edge, and burned with wood in about three days—that is to say, they are said to be burned. Naturally, however, about 70 per cent. are nothing more than hard-baked clay, with not even the red brought out.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Covenants to Repaper and Paint.

BRIGHTON.—P. A. B. writes: "A lease contains clauses definitely requiring the repapering and repainting of a house at certain stated periods during the tenancy. These clauses have not been complied with. Nevertheless, both paper and paint are, at the end of the term, so good as to be almost unobjectionable. This is admitted by the lessor's surveyor. Can the lessor demand repapering and repainting, or, failing this, payment of a sum equal to the cost of so doing?"

The lessor can demand fulfilment of the covenants of the lease. If he waives their fulfilment, even to accepting monetary compensation instead, this is an act of grace upon his part. If the house were left vacant, it would almost certainly have to be papered and painted throughout before a new tenant would enter, whatever its present condition; and the trouble of arranging to have this done should fall upon the present lessee as well as the cost of the work. The lessor is as fully entitled to have repairing covenants fulfilled as he is to his rent.

G. A. T. M.

Determining Height of Broach Spire.

STUDENT writes: "(1) Kindly explain fully the method of obtaining the height of a broach spire, by shadows I presume. (2) Is it usual to measure the windows when the old tracery and mullions have been removed and replaced by new (a total restoration)?"

(1) In order to obtain the height accurately it would be necessary to use a theodolite, but there are several ways in which it can be discovered approximately. If there be an accessible spire light there is little difficulty in finding out the slope of the roof by holding out a short plumb-

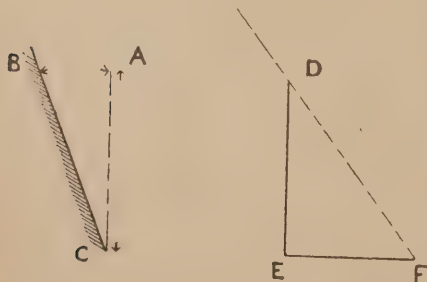


Fig. 1.

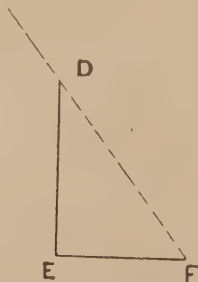


Fig. 2.

line (see Fig. 1) at A, till the plumb-bob at C touches the surface, and measuring the length of line A C and the distance A B, this being greatly facilitated if a friend will measure A B with his 5ft. rod while you hold the line at A. Measure-

ment by shadow is much less accurate, as the shadow of an apex is rarely defined sharply, and churchyards are rarely level. A staff of known length DE (see Fig. 2) is erected and carefully plumb, and the length of its shadow EF is measured. At the same time a mark (such as a pole) is put in the grass at the shadow of the apex of spire. This spot has to be ascertained and plotted on plan so as to discover its distance from the centre of spire (plan of apex), this being the length of shadow of spire. Then height of spire : shadow of spire :: DE : EF. The height thus ascertained is as from the level of the spot on which shadow of apex is cast. (2) If "Student" is measuring a church for the purposes of study only, he would be best advised not to show modern tracery, but merely the enclosing arch of a restored window. There is no rule in the matter.

G. A. T. M.

Sketching at Haddon.

A STUDENT writes: "Can permission be obtained to measure and sketch the interior woodwork in Haddon Hall, and, if so, to whom should application be made? Kindly also mention any other buildings of architectural interest in that vicinity."

There is usually no difficulty in obtaining permission to measure and sketch at Haddon. A uniform charge of 4d. is made for each visitor to the hall. If you wish to measure the interior woodwork it would be well to ask permission of Mr. J. Eades at the cottage adjoining the hall. To prevent a possible disappointment a letter addressed to him at The Cottage, Haddon Hall, Bakewell, might be of service. Rubbings of the carvings are not allowed. For other buildings of architectural interest in the district see an article in THE BUILDERS' JOURNAL for August 14th, 1901: "In the Vicinity of Haddon." The church at Bakewell is of great interest and contains some good Renaissance monuments. Youlgreave Church, two miles distant, should certainly be seen. There is some good Norman work there, and a fine fifteenth-century tower. The key of the church can be obtained at the post-office. The Peacock Inn, Rowsley, built in 1652, and the old hall at Bakewell, built in 1686, are picturesque early Renaissance houses. The old hall at Bakewell is a private residence, but is easily seen from the road. There are many interesting old stone cottages in the district, and the numerous stone bridges are worth notice. See "A Day in the Peak," an excellent local guide-book, which gives descriptions of Bakewell Church, Haddon Hall and Chatsworth, price 6d. (C. F. Wardley, publisher, Buxton). Chatsworth is about three miles from Haddon. It was built 1687-1706 by William Talman, and was added to in the first half of the last century by Wyattville. If the area of the vicinity of Haddon is extended, other buildings would be included. But the local guide-books will show what is worth seeing at a distance.

F. H. CHEETHAM.

Architects' Commissions.

J. writes: "An architect prepared for a committee drawings, &c., for proposed alterations to a chapel. No mention of terms was made, it being assumed that the usual 5 per cent. on the cost would apply. The work has been carried out, and the final certificate amounts to £2,240 (£100 less than the original tender, owing to certain work being omitted, but more than £300 in excess of the architect's revised estimate—the lowest tender was £300 more than his first estimate, notwithstanding that the committee cut out about £450 worth of work). Part of the alterations consisted of a new central porch. This the architect showed in front of the building, and though requested to keep it back he actually projected it 1ft. further, so that a number of tracings, &c., had to be prepared and deposited with the London County Council. He now sends in a bill of charges made up of 5 per cent. on the £2,240, ten guineas for the work omitted (5 per cent. on which would only be £1 2s. 6d.), thirteen guineas in connection with the London County Council application, and a charge for preparing drawings of heating arrangements. We have paid him £100 on account, but refuse to pay the two last items. Are we right?"

It is common to object to the practices of the

architect when the job is finished and payment has to be made. The committee should have absolutely refused at the time to undertake the extra expense with the London County Council. As tacit approval has been given by allowing the architect to proceed, the extra labour entailed must be paid for, but the amount will depend on the work done, which we are unable to judge from your enquiry. The architect is only entitled to 2½ per cent. on the work not done. The question of the heating scheme is difficult to decide, as it is doubtful what work was done in regard to it, if any; but if a plan was prepared and a rough specification drawn, 1 per cent. on its approximate cost would be sufficient. Altogether we think £25 in settlement is a fair offer.

The Columns of the Parthenon and Theseum.

EPSOM.—LIGHT AND SHADE writes: "Is there any entasis on the shaft of the columns of the Parthenon and the Theseum? I want to know for the R.I.B.A. testimonies of study for the Intermediate Examination."

Yes; see Banister Fletcher's "History of Architecture," p. 49.

Alterations, Workmen's Cottages, &c.

LLANFAIRFECHAN.—CONSTANT READER writes: "I am endeavouring to improve my position by taking a few small contracts. I am asked to give a tender for taking down brick partitions for the purpose of making two rooms into one. What would be the price per yd. for such work, making good the walls, ceilings and floor? (2) Also, what would be the cost per cub. ft. for ordinary workmen's cottages having two rooms on the ground floor with pantry under stairs, and three small bedrooms with water-closet and washhouse outside, the owner to provide stone and gravel on the job? The wages of the respective trades per day are, stonemasons 5s. 6d., joiners 5s., plasterers 5s. 6d. to 6s., labourers 3s. 6d. (3) Also, what price per yd. would be sufficient for cow-houses, barns, &c., under similar conditions? The lime and wood, however, would have to be carted, say, two miles, rather up hill."

(1) Jobbing work of this character is usually taken day-work, and to give a price per yd. is always speculative. We are quite unable to give the latter without seeing the job, and the size of the girder will depend upon the weight it has to carry which you do not state. We should say roughly that it would cost £1 per yd. super, with extra for the girder. (2) Roughly about 5d. per ft. cube. (3) Roughly 3d. per ft. cube. To estimate, one must know the rates of wages locally and price of materials, &c., and of course this the price-books will not give. It is only necessary to carefully measure up all the items in detail and work up the prices to the method given in Stephenson's "Estimating" (published by Mr. B. T. Batsford, 94, High Holborn, W.C., price 5s. 6d.).

Payment to Assistant during Holidays.

MORECAMBE.—W. S. V. writes: "Is it usual for architects to allow their staff, say, two weeks' holiday a year? Supposing a clerk did not, through stress of work, obtain his usual holiday, would he be entitled to receive his wages for the fortnight in lieu of holidays?"

It is usual for architects to give their staffs two weeks' holiday in the summer, paying them their salary during that time; this is generally included in the agreement. If an employee is engaged upon this distinct understanding, opportunity must be given him to take his holiday, but if he is willing to forego it we think he is entitled to four weeks' salary in lieu of it, namely, two weeks' salary for the time he works and compensation for the two weeks' holiday he loses. This becomes apparent when it is recollected that if he insists upon taking the holiday he must be paid two weeks' salary and a substitute would have to be obtained by the employer for two weeks to do the work.

Thwing Parish Church, East Yorkshire, is proposed to be restored. It was built in the twelfth century, and contains some fine specimens of Norman architecture. In 1900 extensive repairs and improvements had to be made to save the ancient edifice from ruin.

THE ÆSTHETICS OF CONSTRUCTIVE DESIGN.*

AN ARGUMENT FOR SHAMS.

By C. H. BLACKALL.

[We do not in any way uphold the principles set forth in this article, but it is always well to see two sides of every subject. We have many times expressed the opinion that truthful construction is absolutely essential to progress in architecture. Mr. Blackall thinks otherwise. This is the main issue, and readers can form their own opinion.—ED. B. J.]

NOW it would be farthest from my intention to claim that we should in any sense carry out the Ruskin idea of truth in construction. Because we have knuckles and shin bones is no reason why they should be obtrusively prominent, and the fact that we have an admirable steel skeleton hidden away inside of a building is no excuse for parading that skeleton on the outside and making a hideous virtue out of a mere structural necessity. We are perfectly justified in taking a good deal for granted, especially when dealing with so conventional an art as architecture. But there is an æsthetic element of construction which our modern methods tend to make us ignore. It is not enough that our buildings shall be scientifically strong, well knit and enduring. It is not enough that our steel skeleton will of itself, unaided by any masonry, amply withstand all possible stresses. We must go a great deal further than all this if we are to have a good architecture, and must make our buildings not merely be strong but they must seem so. I will even go further. If our buildings are not what they seem to be, they must at least seem to be what we mean they shall seem to be. This is not sham, this is not being false to a construction, but it is as manifestly common architectural sense as it is to design any feature of ornament, so that when seen from its proper point of view it shall be an integral part of the building. The construction must be manifest, not by showing the materials or the exact way in which the materials are used so much as by presenting the impression of the innate character of the building, giving the effect of its strength and permanence and carrying out its visible forms, the real intent of the structure.

It will be remembered that quite a number of years ago some very serious attempts were made to design steel buildings so that they should seem to be nothing but steel, and classic forms were twisted in an attempt to impart to them a metallic character, while the arrangement and disposition of the exterior design was made in such way that we thought we were really giving a steel character to our buildings. This attempt has been carried much further in France than in any other country. Notably in the exhibition of 1878 and in the subsequent exhibition buildings, metallic constructions were developed on a line which was certainly interesting, though seldom beautiful as compared with the designs in stone, brick and terra-cotta. The attempt to so treat the construction, while by no means a thing entirely of the past, is not now seriously considered, and especially in America architects seem to have reverted to classic forms, or to at least traditional forms, and of late years the buildings, while actually lighter than they ever were before, have in appearance a robust strength which is far more pleasing than the attenuated attempts at metal construction.

The Jesuitical doctrine that the end justifies the means comes pretty near being of universal application to architectural design. Architectural construction in the æsthetic sense will not always bear scientific analysis. An excellent example of this is afforded by that superb creation of Michelangelo, the dome of St. Peter's. What difference does it make if the drum has to be heavily banded with massive iron chains? Is that any worse than to have built a steel skeleton in the dome and placed the masonry outside it? An iron girdle is, after all, a pretty simple and straightforward piece of construction, and there is hardly a grander archi-

tectural conception in the world than this enormous mass of masonry towering so high above the church.

Take another example in the dome of the Capitol at Washington, which is structurally in some respects the veriest sham. The base is nothing but sheet-iron clamped around a masonry drum, while the dome is constructed of cast-iron bolted together in sections; and yet even the most rigid critic would be willing to admit the majestic beauty of the dome as an architectural conception. It has the solid, substantial look which we can admire near by or at a distance, forgetting of what it is made. It is æsthetically well constructed, it builds up rightly, it hangs together coherently, and these very qualities are what we need to insist upon nowadays in our work. I am not saying that the dome of the Washington Capitol would not be quite as satisfactory if it were really as solid and substantial as it looks, but the point I would make is that in designing our buildings we must in any case obtain the appearance of solidity even if we have to resort to steel beams and devious twists to obtain it.

Shams in architecture are pretty hard to define. Viewed in one light, Giotto's Campanile and the Baptistery at Florence are mere veneers of architecture, the decoration having not the slightest relevance to the construction. Viewed in another light, these very buildings are clothed in the mantle of purest but most appropriate design, and it is no more necessary that the mantle of beautiful incrustations should in any wise suggest, recall or fit itself to the construction than that the mantle which a beautiful woman wears over her beautiful shoulders should suggest the articulation of her skeleton. It is simply a matter of what we are pleased to accept as essential conditions. The number of shams which are called good architecture is legion, and they stretch from the time of the Egyptian temples down to the Pan-American Exposition. Logically, the Egyptian column carved in stone in the simulation of a weak bundle of lotus stalks with a flared cap looking as though it were partially squashed out under its load, is thoroughly bad as a *motif*, but no one will contest its effectiveness, and it answered its purpose perfectly.

The first fundamental law of all good architecture, of all constructive art, is that it shall present the appearance of stability. I say the appearance rather than the fact because in these days of steel beams and engineering science we can make anything absolutely secure, but the engineering minimum is by no means the architectural limit. We must make our buildings look secure, and to do this it is generally necessary to make our piers, our arches and our constructive members in general far larger and heavier than would be demanded by mere abstract equations of strength. For example, the reading-room of the Congressional Library is roofed by a flat dome springing from heavy piers at the corners of the octagonal plan. I do not know what the actual construction may be; from an æsthetic standpoint it matters very little whether the actual load is carried down to the ground by a steel column or whether the piers are, what they appear to be, solid masonry. The resulting effect in either case is of a very solid, massive construction, admirably proportioned to carry the apparent load which comes upon it, but undoubtedly far in excess of any real strain. I do not believe it is possible to design a dome of this description and proportion the supports exactly to the load without producing a skinny, unstable appearance which would be in every respect unsatisfactory. As contrasted to the interior of the Congressional Library, compare the design of the interior of the dome of the Capitol. On the ground floor this construction presents a solid wall pierced only by small openings on each axis and with the wall marked at intervals by thin, slightly projecting pilasters. Here is a case of a solid wall which has absolutely a weaker appearance than the isolated piers of the former example. The pilasters are apparently so inadequate to really hold anything that they are neither constructive nor decorative and add a decided element of weakness to the design. Another comparison in which the difference is even slighter is afforded by the supports of the dome of St. Peter's and the corresponding construction under the dome of the Pantheon in Paris.

The latter, from an engineering standpoint, is light and graceful. The stone was cut down almost to the danger point, and it looks even weaker than it really is, whereas the Roman example has the solid, massive appearance which was needed for the task it had to æsthetically carry out. Soufflot's dome may stand just as long as Michelangelo's, though it has nowhere near the same appearance of innate stability. From these, and from other instances which might be quoted all over the world through all the history of architecture, we draw our first law, that constructive architecture must seem secure.

The second essential is that individual features which by their origin, association or use have a constructive appearance may be used in a purely decorative sense though actually supporting nothing, but in order to be æsthetically satisfactory they must retain the apparent functions of support. The use of the column affords perhaps the most conspicuous illustration. This is a feature which is nowadays very fashionable and is used in all sorts of ways, but the moment an architect undertakes to cut down its proportions below those that have been sanctioned by use, the decorative element begins to lose interest. An illustration of this can be drawn from the interior finish of the Paris Opera House. The large columns which support the boxes and the ceiling might with perfect safety have been reduced to mere shafts 6 in. or 8 in. in diameter, instead of which they were made large, round, and in a general way following the classic proportions. Again, the arch has come to be almost entirely a decorative factor in our modern design.

The third essential of constructive design is that the building as a whole must be more solid in appearance at the base than at the top. The architect is frequently called upon to set his buildings up on stilts, and it is by no means an easy problem to get around this condition in such manner as to make the building look thoroughly stable. But this is possible, as any one will admit who has carefully studied the recent tall building construction in America. If the column spacings are forced to an abnormal degree there must be some corresponding increase in the treatment of the supports that are left.

A fourth generalization which seems to be sufficiently acceptable to count as a rule is that in constructive design there must not be an abrupt transition from one type to another, but where for any reasons different schemes for constructive design seem to be called for there must be some easement between the two. For example, an arcade springing directly from the capitals of columns is rarely quite satisfactory. There is a sense of conflict between the arch and the column which appears to be less pronounced when some intermediate medium such as an entablature or even a cushion cap is introduced between the two. A wonderfully clever illustration of this is afforded by some of the Venetian work. In the Doges Palace the external columns in the lower storey are solid and massive enough in appearance, as well as in fact, to support the plain wall above, but the transition between the stolid vertical supports and the unbroken wall surface is softened by the interlacing tracery of the second storey arches, which seem to catch up the load from a hundred different points and gradually draw it towards the solid lines of the base. Rarely in modern work are we able to so successfully combine two constructive features as was done in this noble monument. Had the same principle been applied to the treatment of the base, so that instead of merely sticking up like a row of pegs from the ground the columns had sprung from some pronounced stylobate eased off toward the line of the ground, the fine points of this remarkable design would have been much more apparent.

The foregoing principle is in a sense embodied in a generalization which I shall put last, though it is quite as important as the others, namely, that a building shall appear to be rooted rather than sprouting, to be built into the ground and up from it rather than merely stuck into it.

There are some dicta which at one time were considered as almost fundamental, but which modern matter-of-fact necessities have refused to accept. One of these is that the exterior of a building shall accuse, as the French put it, its

* Part of an article which appeared in the "Architectural Review" of Boston, U.S.A.

interior plan. This may perhaps be considered a matter of taste rather than constructive design, but if all our buildings were to accuse themselves in the frank manner that we were taught was essential twenty-five years ago I fear our architecture would be a sorry hodgepodge. It is pleasant to have all the interior arrangements manifest to the casual observer passing by; but to seriously claim this as an essential element of constructive design is, in the light of modern experience, quite uncalled for.

Bricks and Mortar.

APHORISM FOR THE WEEK.

An Egyptian temple appears to have been one of the most imposing assemblage of buildings that can well be conceived.—The late PROFESSOR DONALDSON.

Our Plates. THE house at Greenroyd, Halifax, was built for Mr. John Bairstow, B.A., of local sandstone, the hewn work being of millstone grit. It is roofed with stone slabs. The plans are slightly at variance with the perspectives, some alterations being made to the offices at the west end of the building after the perspectives were drawn. The contractors are:—Mason, C. Robinson & Sons, Halifax; joiner, S. Wadsworth & Sons, Halifax; slater, Rushworth & Firth, Halifax; plasterer, T. Nye & Co., Halifax; concretor, J. Bancroft & Son, Halifax; plumber, R. P. Stafford, Halifax. The perspective views were drawn by Mr. H. F. Waring. The architects are Messrs. Joseph F. Walsh & Graham Nicholas, of Museum Chambers, Halifax.—The perspective of the Working-Men's Club, King Cross, Halifax, was prepared by Mr. H. F. Waring. The outer walling is of local flat-bedded self-dressed sandstone in thin courses, with boasted ashlar sandstone dressings throughout. The windows have plain leaded glazing with $\frac{1}{4}$ in. wide flat comes. The roofs are of blue Welsh slates. The joiners' work is of pine throughout. In addition to the accommodation shown upon the accompanying plan, there is a basement under the whole containing two slipper baths for the use of members, heating apparatus, store-rooms, cooking kitchen, and caretaker's house, comprising living-room, two bedrooms and larder.

The total cost was a little over £2,000. The work was carried out by local contractors under separate trades, the work of each trade being supervised by a member of the club and of that trade under the general superintendence of the architects, Messrs. Joseph F. Walsh & Graham S. Nicholas.—The design for Keighley Free Library was placed first by the assessor, Mr. Leonard Stokes, in a recent competition in which 146 designs were submitted and is now being carried out with some slight modifications. The disposition of the plan is explained by the fact that on the south side of the site sufficient land was provided for future extension; the principal rooms were consequently placed on this side. Accommodation is provided as follows:—(Ground-floor), newspaper reading-room for 150 readers, separate ladies' room; lending library space for 40,000 volumes; (first-floor), reference library 4,000 super. ft. and accommodation for 40,000 volumes; patent library 2,000ft. super.; store for valuable books; rooms are provided for the staff (both sexes); workroom and store-rooms on the ground and basement floors. The building is faced with local freestone and the roofs covered with green Westmorland slates. Internally the walls will be plastered down to the dado, which will be of dull glazed tiles—the floors of the principal rooms are to be of wood-block on concrete, and those of the halls of marble mosaic; the ceilings of plaster panelled in simple forms; the woodwork generally of pine stained a suitable colour and varnished. The buildings will be heated by hot water at low pressure and lighted by electricity. The cost of the buildings will be about £10,000. Messrs. McKewan, A.R.I.B.A. & Swan, of Birmingham, are the architects. The perspective is in this year's Royal Academy exhibition.

A Schedule of Church Architecture.

ANOTHER discussion has been started about "The Clergy and Art." One learns that there is an organisation in existence for scheduling all church antiquities of importance. In the course of the publication of "The Victoria History of the Counties of England" (of which Mr. H. Arthur Doubleday is the editor) every parish in the country will be visited by experts, who will carefully describe not only the churches and their fabrics, but also all domestic architecture of any importance.

All proposed restorations which come under the notice of the "Victoria History" staff will be reported to the Society of Antiquaries and to the Society for the Preservation of Ancient Buildings, in the hope that these bodies may be able to restrain local zeal.

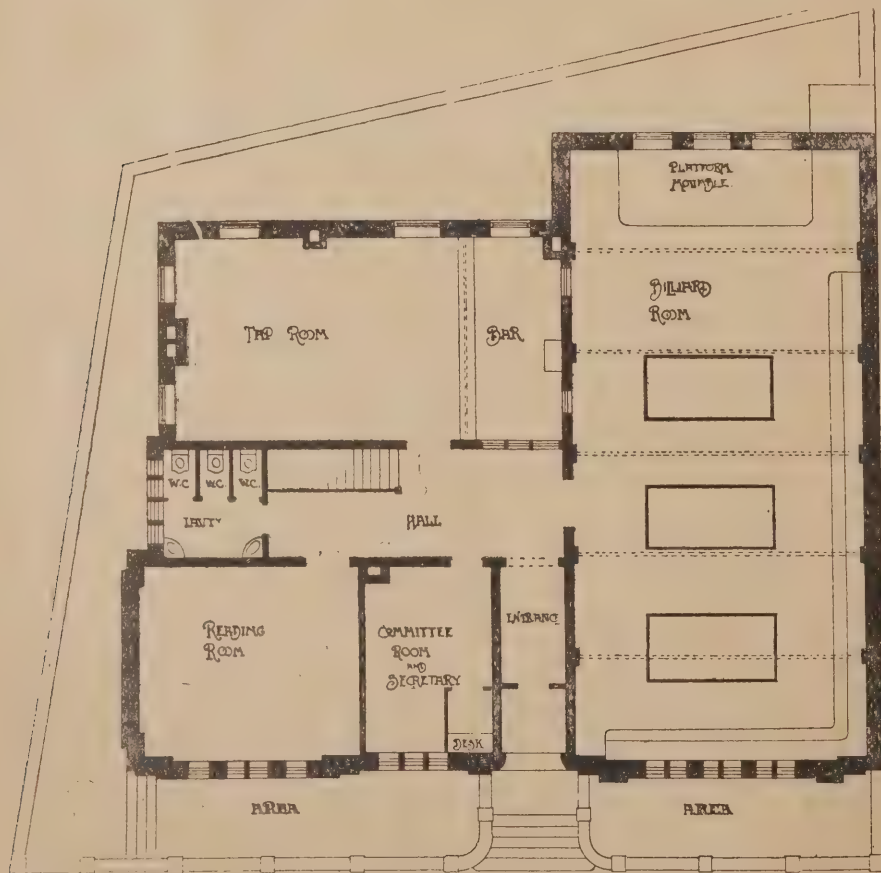
Antiquities in the Sudan.

MR. JOHN WARD, F.S.A., writes: "We have all heard of the temples and pyramids at Meroe, but few were prepared for the discovery of ruined Christian cities beyond Khartum. In the beautiful garden of the palace at Khartum I saw a huge stone Paschal lamb of evident Roman sculpture. Father Ohrwalder told me that this was brought from the ruins of Soba, on the Blue Nile, 25 miles beyond Khartum, in Gordon's time, and that he knew the place, which abounded with the remains of Christian temples, and was once the centre of a civilised kingdom. Colonel Stanton, Governor of Khartum, found me a map of the country round Soba, with the ruins laid down. Since then he has visited the ruined temples himself and is preparing to have them cleared from the sand and photographed. About 80 miles north of this there are the extensive ruins of another city—Naga—with fine temples of Roman architecture, avenues of lambs, the same as the one at Khartum, leading up to them. The inscriptions are in hieroglyphs, while the composite capitals of the columns bear the cross, both at Soba and Naga. So far south, Roman work of Christian times with hieroglyph texts is a novel combination and demands further research. Since I left Khartum Colonel Stanton writes me that he learns from the natives that there are many similar ruins spread all over the country, and, 80 miles east of Khartum, sculptured rocks and inscriptions, even as far away as Darfur."

Old Frescoes at Eton.

A SUGGESTION has been made that a very appropriate memorial to those Etonians who have fallen in the war would be to lay bare and restore the admirable series of frescoes by Flemish artists painted in 1480-1, which are known from their rediscovery in 1847 to exist behind the canopy of the stalls in Eton College Chapel. If low stalls similar to those seen in many fifteenth-century churches were substituted for the present imitations of those in St. George's Chapel, Windsor, the two tiers of paintings behind could remain exposed to view and would constitute a most interesting monument of art in the fifteenth century. Those who are acquainted with Dartford parish church will remember the very successful restoration of a fourteenth-century fresco of the "History of Saint George" in one of the side chapels, and there is no reason to believe that an equally successful restoration of the Eton College frescoes could not be undertaken. The subjects are taken mainly from the "Golden Legend" and the "Speculum Historiale" of Vincent de Beauvais, and strongly recall Hans Memling's work at Bruges, and probably, in their general effect, Andrea da Mantegna's work at Padua. As the present stalls date only from 1847 they have no particular historical value, while many examples remain to show us that low stalls, surmounted by a low wainscot, may be most impressive: for instance, the hall of the Senate in the Doge's Palace at Venice.

A VERY rambling series of Windows in China. notes on a special tour in China is appearing in the "American Architect," but it is possible to pick one or two interesting items. Windows, for instance. Speaking of those in a certain important house in Shanghai the writer says they had close, net-like wooden frames covered with paper, but all the little squares were broken and no attempt had been made to repair them—a very different state of affairs to that of Japan. There, if by accident a hole is made in the shoji, a piece of paper is cut out in the shape of a cherry or plum blossom and the hole patched up with this tasteful device: and this is seen even in the poorer houses of Japan. Reverting, however, to the Chinese house, our writer observes that while the window-frames in the kitchen and out-buildings consisted of a close framework covered with paper, in the house proper many of the



WORKING-MEN'S CLUB, KING CROSS, HALIFAX.
J. F. WALSH AND GRAHAM NICHOLAS, ARCHITECTS.

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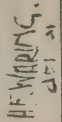
SOUTH FRONT.



NORTH FRONT.

HOUSE AT GREENROYD, HALIFAX. J. F. WALSH and GRAHAM NICHOLAS, Architects.

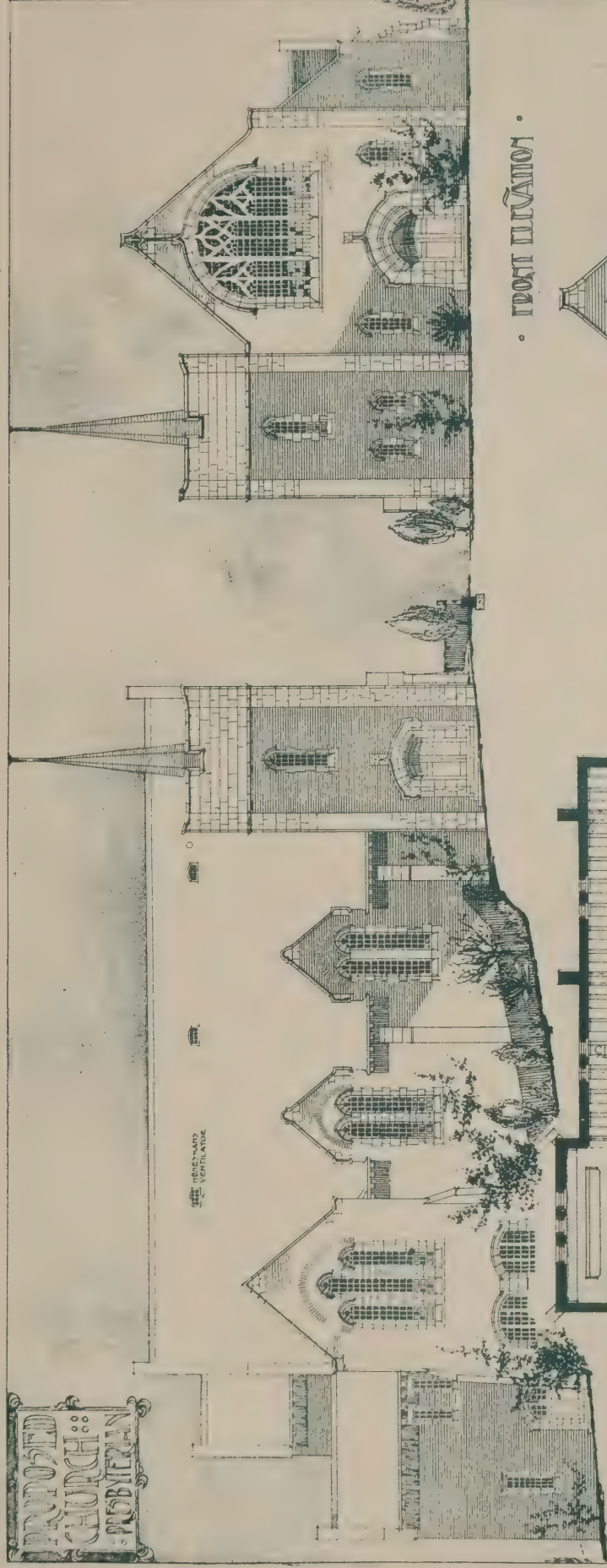
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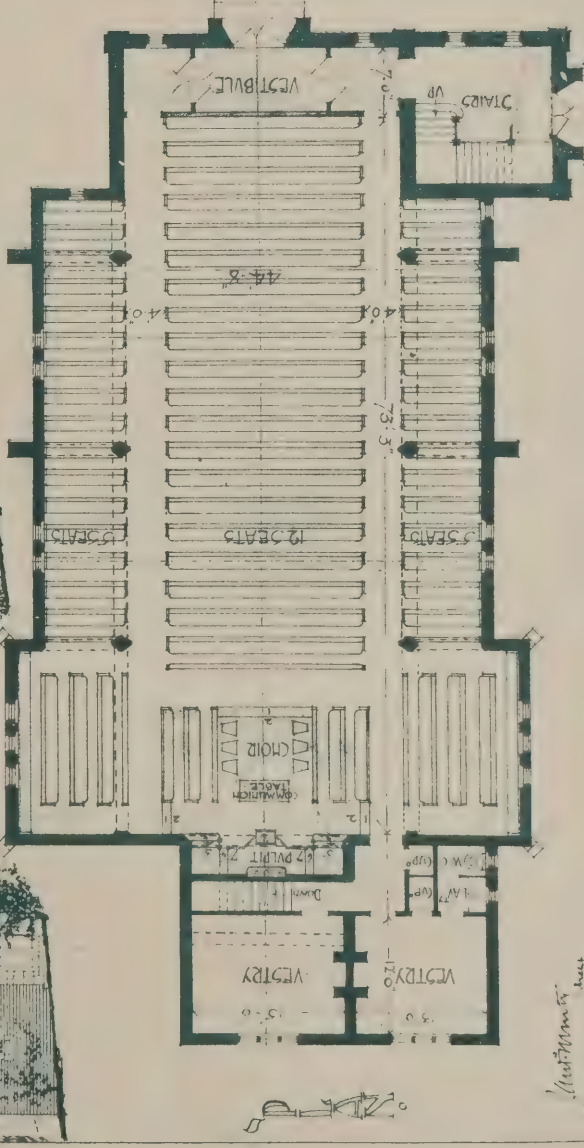
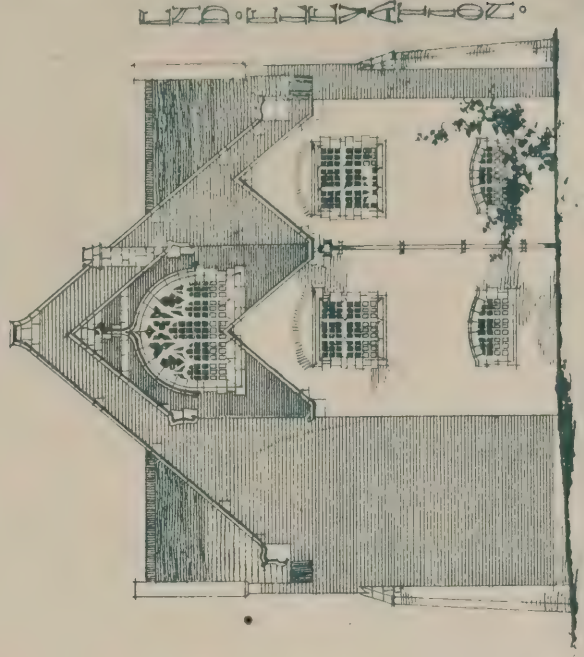
"INK-PHOTO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

J. F. WALSH & GRAHAM NICHOLAS, Architects.

PROPOSED CHURCH FOR ROBINET

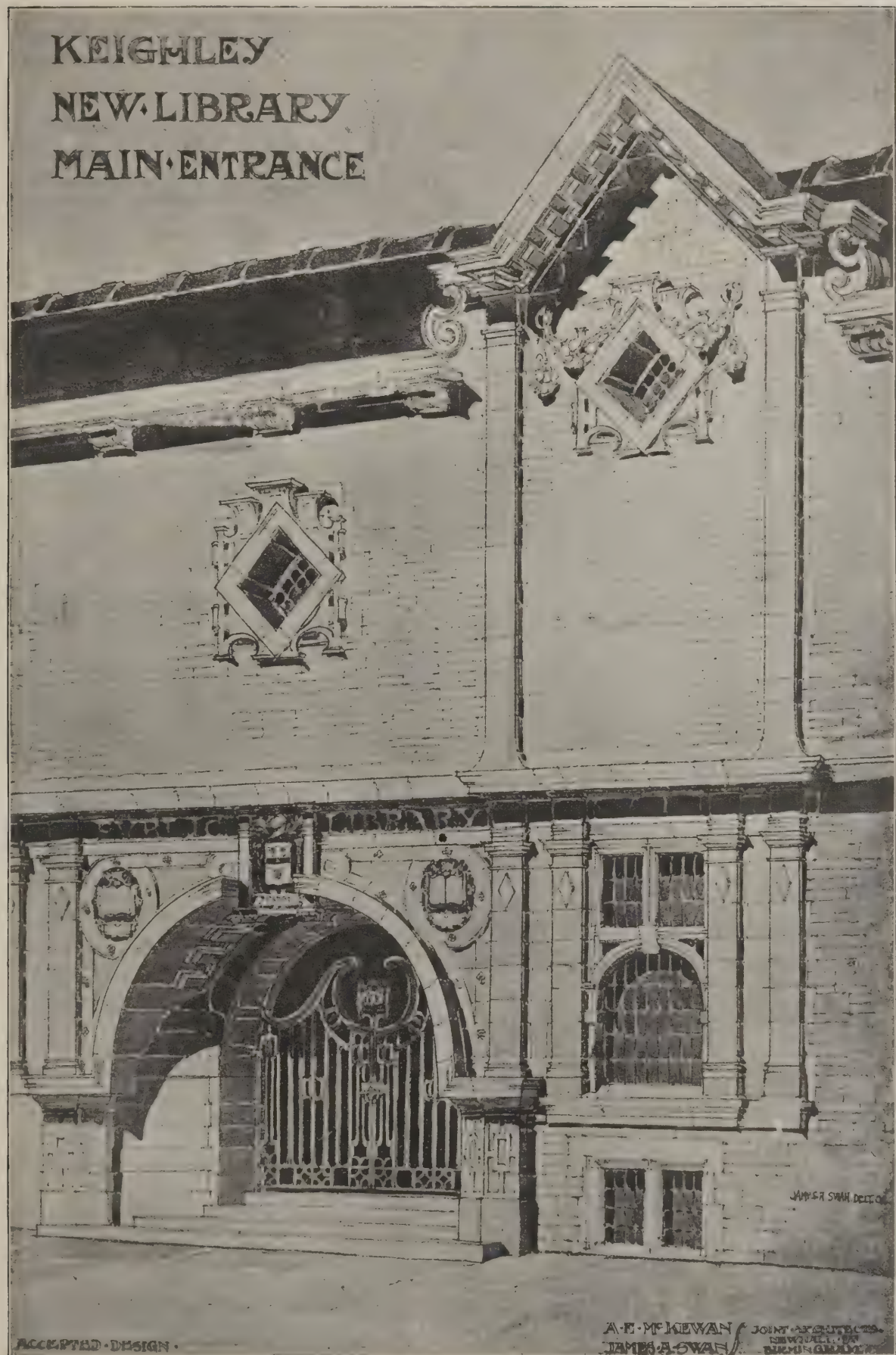


• ELEVATION •

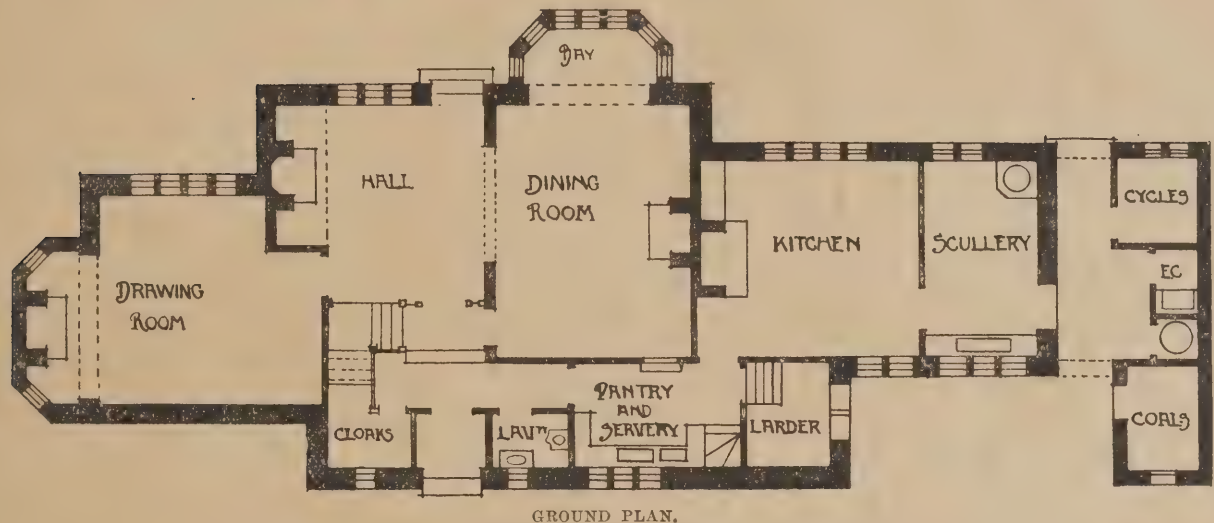
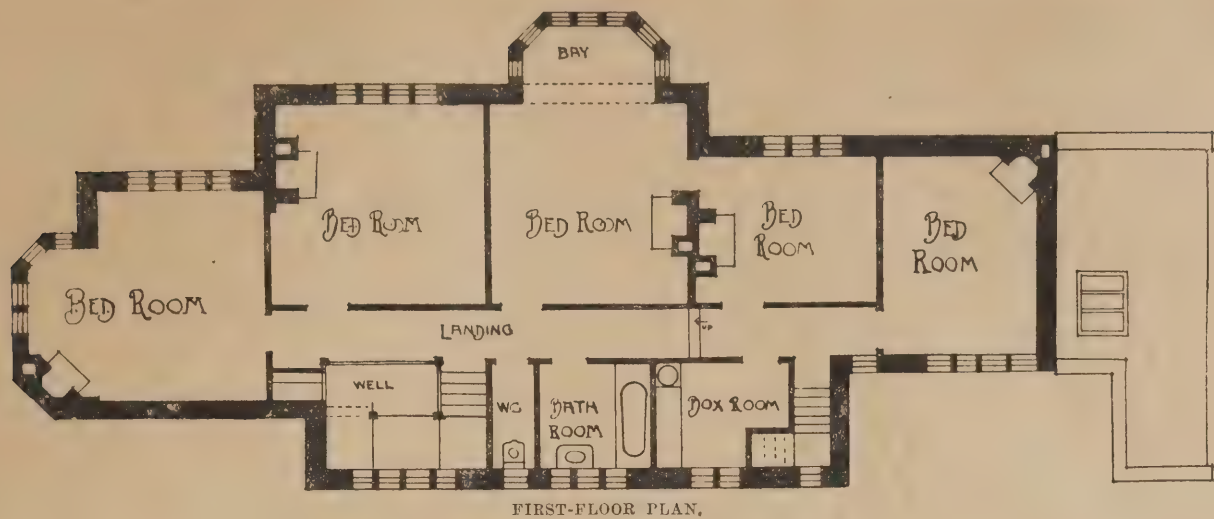


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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, June 4th. 1902.



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HOUSE AT GREENROYD, HALIFAX. J. F. WALSH AND GRAHAM NICHOLAS, ARCHITECTS.

windows were made of vertical slats of bamboo 3in. apart, to which were tied the thin, translucent shells of a species known as *Placuna*. These shells are flat, circular, and are trimmed into a rude square and perforated at the edges so that they may be tied to the bamboo frames. The shell admits only a dim light and represents the window-glass of China. The use of this material by the Chinese is a good illustration of their conservatism. Window-glass can be cheaply purchased in the foreign concession, yet the usual contempt that the Chinese holds for anything foreign confines him rigidly to this archaic device.

Strasburg Cathedral. The German Society of Architects applied some short time since to the German Government to contribute towards the cost of restoring Strasburg Cathedral. The authorities at Berlin met this request with a somewhat abrupt refusal and gave the Society of Architects to understand that it had no business to interfere in the matter and that the initiative rested with the custodians of the cathedral or the Diet of Alsace-Lorraine. It was further pointed out that the Government had no funds at its disposal for the purpose suggested, and that the repair of public buildings was the duty of the local authority. The Society of Architects is resolved not to be beaten, and contemplates making an appeal to Parliament on the subject.

White House, Washington. The plans for re-modelling the White House at Washington by adding curved wings and other features seem, happily, to be laid at rest for the present, and some simple changes are to be made in the interior so as to obtain more family rooms, while the President's business-offices are to be removed to a temporary structure which will be built south of the White House,

near the State Department. The cost of the changes will, it is estimated, not be more than 150,000 dols., including such decoration as may be necessary, which, by the President's desire, is to be in the simple style prevailing in this country at the period of the original construction of the building. The whole scheme seems to be straightforward and practicable, and will commend itself to those who have been dreading for two or three years the consummation of the plan for making the White House ridiculous by appending to it the curved colonnades, with intercolumniations nearly equal to the height of the shafts, and entablatures held up by complicated framing, which, as the newspapers informed us, had been decided upon.

Home Arts and Industries. THE annual exhibition of the Home Arts and Industries Association was held last week at the Albert Hall. The exhibits showed an improvement on last year, and there was much excellent work shown. The most striking exhibits were several gesso panels, designed and coloured by Mrs. G. F. Watts, forming part of the decoration for the chapel at Compton, Surrey, which has been erected by Mr. Watts. Various works in terra-cotta, from designs by Mrs. Watts, were also shown at the Compton class. At the stall of the Ickleford (Herts) class was shown a canopy in repoussé copper for the hall fireplace (in oak) at Highfield Hall, St. Albans, executed for Mr. F. W. Kinnear Tarte, architect, to his designs. Mr. Tarte sets an example which other architects would do well to follow in giving commissions to the Association to execute decorative work. The Yattenden class showed some curtain fabrics in dark colouring which were very pleasing, as also were most of the hangings at the various stalls. The Kent County Council class is doing excellent work in reviving the old brocaded silks, and their wood-

carving is good too. At the Heversham stall an excellent lead bucket by Mr. P. J. Hiebert was shown. The Keswick class is especially strong in metal-work, an altar cross and memorial tablet from designs by Mr. H. J. Maryon deserving special mention. The wood inlay work by the Escrick class was good, especially two chests executed by Mr. Ernest Easterby from designs by Mrs. Hodgson. Mr. H. Rathbone's Birkenhead class exhibited examples of their well-known Della Robbia pottery, which is always so important a feature of the exhibition. The toys from Ireland were most happy, and also two rocking-horses from designs by Mr. Cecil Aldin were most quaint. What strikes one about the exhibits as a whole is that all the workers have taken interest and pleasure in their work, the essential requirement of art-work; and, though often amateurish, they have a charm which is entirely absent in the works of trade firms turned out merely for profit in the ordinary hurried machine-made way.

Mr. Owen Williams, an architect and land surveyor, of Liverpool, died recently. He converted Llandudno from a cluster of fishermen's huts into the fashionable watering-place it now is.

A New Congregational Church at Avonmouth has been erected of pennant stone. There is a low tower surmounted by a weather vane, the upper part of the tower being utilised as a large classroom. The accommodation of the church is 500, including the gallery at the back, and there is a hexagonal church parlour, or hall, capable of seating 120, and the usual vestries and offices. The main building has an open-timbered roof of stained oak, and consists of the nave and two aisles, the roof over the aisles being supported by oak pillars. The whole of the building inside is of buff bricks with Bath-stone dressings. Mr. G. H. Oatley is the architect.

WET OR DRY CONCRETE.

IN a recent issue of the Journal of Western Society of Engineers Mr. J. Hirtz describes some experiments made for a railway company to ascertain whether any advantage was gained by using concrete mixed rather dry. Authorities on concrete have differed very much on this point, some as the result of laboratory experiments having recommended that the water added should be kept down to the lowest possible amount, while others prefer an excess of water. Actual practice has also differed, for enquiries showed that out of thirty-five prominent railroads ten preferred a dry mixture, five a moderately dry one, sixteen a moderately-wet mixture and four a wet mixture. In the experiments referred to the concrete consisted in each case of 1 part of Portland cement, 2 parts of sand and 5 parts of stone. This was mixed and moulded into 3ft. cubes. In the one case the water added was 82 per cent. of the volume of the dry concrete, and as a consequence the mixture was so wet that it was difficult to handle. In the other case the water added was 44 per cent. of the volume of dry mixture, and the heavy tamping was necessary to consolidate the concrete. The tamping was done on each 6in. layer. After thirty days it appeared that the wet concrete weighed 9.7 per cent. more than its fellow; it had further a much better surface, and on being broken proved of much higher quality, the interior being a solid and compact mass with the surface of fracture passing through the limestone and granite pebbles of the aggregate. The broken surface of the dry concrete

block on the other hand showed numerous voids and pores, and a much higher percentage of stone and pebble "pulled out" in place of breaking. It is obvious from this that plenty of water should be added to the mixture in order to produce the best concrete.

"To obtain perfect results in concrete," says a writer in "Stone" (New York), "one should have freshly-ground cement of some well-known and established brand, coarse, sharp, clean sand free from all foreign matter and hard stone crushed or broken to a size that will pass through a 2in. mesh, screened and washed free from dust. Find by actual test how much cement it takes to fill the space in the sand. When the sand and cement is thoroughly mixed it should occupy the same space that the sand did before the cement was mixed with it. For instance, if one barrel of cement and two barrels of sand are the proportions, when the cement and sand are thoroughly mixed dry they should just fill the two barrels. The same rule applies to the broken stone. The sand and cement mixture should fill the space in the broken stone. This must be found by actual test, but they will generally be found to be 3 parts of broken stone, 2 parts of sand, 1 part cement. The next question is how much water is needed. This can be determined beyond dispute in the following manner:—Thoroughly mix with water so that when the mixture is put in place in layers of 6in. and hammered with a paving hammer, the water oozes to the surface without any surplus to run off. This is perfect concrete with all the above conditions filled. This is a leaf from an experience of thirty-five years with concrete in all conditions."

Builders' Notes.

Plumbers' Registration.—Mr. Powell Williams presented in the House of Commons last week a petition from the Birmingham Corporation in favour of the Plumbers' Registration Bill.

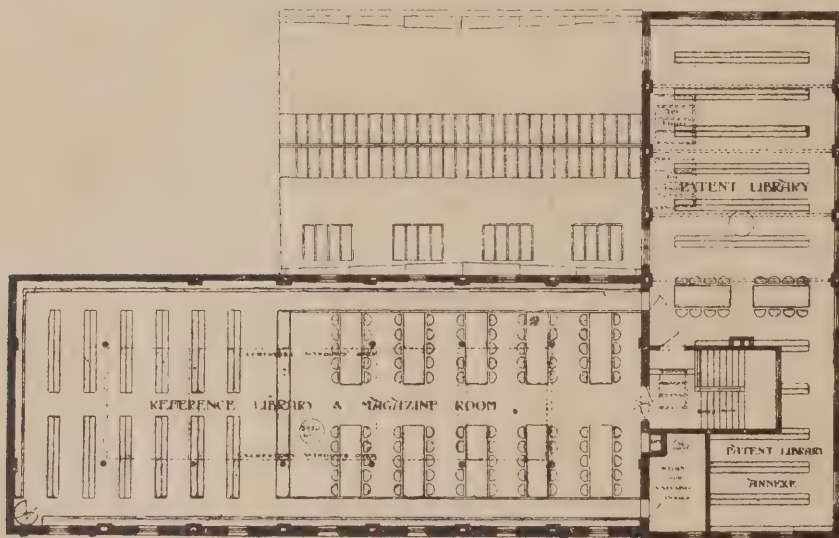
Presentation to a Buildings Surveyor.—The Manchester Corporation officials have presented a gold watch to Mr. Henry Price, their buildings surveyor, who is about to take up the position of city architect at Manchester.

A Hull Builder's Affairs.—A meeting of creditors of T. A. Richardson, builder and contractor, of Hull, was recently held at the Official Receiver's offices. His gross liabilities are £6,875 7s. 3d., expected to rank £881 8s. 1d.; assets estimated to produce a similar amount. He attributed his failure to inability to sell his properties and to want of capital.

The Paris Fire Brigade.—The French Prefecture of Police has recently published a statistical report for the year 1901 on the regiment of firemen of the city of Paris, from which we extract the following figures:—There were 1,422 outbreaks of fire in Paris during the year, and the damage occasioned is estimated at £236,000. In 1,268 cases the brigade arrived on the spot within from five to ten minutes, and in only eight cases the time extended from twenty-five to thirty minutes. In 928 cases the fire was extinguished in less than five minutes, and in one case the fire lasted three hours and a half. The Paris fire brigade consists of 1,805 men, fifty-two of whom are officers. The total expense of the brigade for the year 1902 amounted to £144,500. The apparatus consists of forty-six waggons, three of which are electric, twenty-seven steam pumps, 166 reels, twenty-six fire-ladders and about 70,000 yds. of hose.

Coronation Stands.—In the House of Commons last week Mr. Grant Lawson, in reply to Mr. T. R. Dewar, said the licensing of stands for the Coronation was under the jurisdiction of the metropolitan borough councils. The licence might prescribe conditions as to the structure, and the London Building Act provided means for the enforcement of those conditions. In the event of any structure being, in the opinion of the district surveyor, "a dangerous structure," it would be condemned as such, and dealt with by the County Council. The question of the safety of balconies was a matter for the County Council, and he was informed that they had issued warning notices to the occupiers of houses with balconies on the line of route of the processions. He was not aware that there was any complaint of an insufficient staff of inspectors. Indeed, he understood that the necessary extra staff had been employed by the borough councils. He was assured that everything was being done to secure the safety of the public.

Lay-out of Streets.—Building regulations in Paris were a few years ago made to ensure conformity to the general plan of the district, says the "Manchester Guardian." Hence its newer suburbs are conveniently laid out. The lines of modern New York are even more definitely prescribed. The rule there is twenty blocks to the mile. All new "cross-town" streets must be at exact right angles to the main avenues which run north and south. The English eye is not pleased with a rectangular city, but the English mind can hardly deny that a confusion of irregularities is folly. While the County Council are spending millions to make straight the crooked ways in the heart of London, new difficulties for posterity are being pegged out north, south, east and west. A *cul-de-sac* is apparently the builder's special delight. Even in progressive West Hampstead many new streets are being most curiously planned. In a straight line Minster Road and Gondar Gardens have steadily approached each other across a great estate until barely 100ft. of land intervened. Had the two ends met, a wide and direct highway would have joined Kilburn, Willesden and Cricklewood to Hampstead, Child's Hill and Finchley Road, and made a connection between the two great trunk roads to Hendon and the north. But down the intervening strip a street has been cut at right angles to the almost connected roads. Apparently for the sake of crowding in two extra villas, a check has been put to what might become a coherent scheme.



FIRST FLOOR PLAN



GROUND PLAN

KEIGHLEY PUBLIC LIBRARY. MCKEWAN AND SWAN, ARCHITECTS.

BUILDING NOTES AND
MEMORANDA.

By T. E. COLEMAN, F.S.I.

IN the preparation of estimates for building or engineering works it is essential that the estimator—whether architect, engineer, quantity surveyor, or builder—shall be intimately acquainted with the various measures and customs obtaining in the different branches of the building trade, so that the quantities of materials and workmanship required may be reduced to those standards which are in local use, for convenience of pricing at local rates. For instance, in London the cost of brickwork is estimated at "per rod of reduced brickwork." A rod of brickwork contains a superficial area measuring 16½ ft. by 16½ ft., or 272½ ft. super. (for convenience taken at 272 ft. super.), and having a standard thickness of 14 in., or 1½ bricks thick. In some localities, however, it is customary to describe and estimate the cost of brickwork at per "rod" of reduced brickwork, containing 63 ft. super. of brickwork 9 in. thick (or 6½ rods per rod of brickwork), whilst in other districts brickwork is reduced to the unit of "per yd. super. of 14 in. brickwork." In engineering works the brickwork is frequently estimated at "per cub. yd." of 27 cub. ft.

The practical estimator should also possess some knowledge of the cost of labour, local rates of wages, and the current prices of the principal building materials, such as bricks, stone, timber, iron, steel, &c.

It is well known that the cost of ordinary building work has risen considerably within recent years owing to the increased prices paid for labour and materials, but, on the other hand, the cost of certain descriptions of engineering work has in many instances been greatly reduced by the use of ingenious or improved machinery and labour-saving appliances generally. Amongst these modern aids to economy of construction may be mentioned steam pile-drivers, steam navvies, electric and hydraulic riveters, improved stonebreakers, concrete mixers, pumps, rock drills, &c. Engineering works are also now rendered possible which before were either prohibitive in cost or practically impossible of execution owing to the lack of suitable appliances. The use of air-compressing machinery and the application of the "Greathead shield" in tunnelling operations are well-known examples illustrating the progress which has taken place in this respect.

The actual cost of a building or work is not necessarily a correct index of its true value. In some cases the contractor under-estimates the difficulties or probable cost of executing the work, or he may find it advantageous at that particular time to carry out the work with little or no profit in order to find employment for his workmen, machinery and plant, so that the work may be completed at an unreasonably low unit of cost, or even much below its proper value. On the other hand, if trade is good and the contractor has an abundance of work in hand, then he will sometimes tender at exorbitant rates with the prospect of obtaining extravagant profits; or it may be that the prospective cost of carrying out the work is largely over-estimated, with the result that under such conditions the unit of cost as given by that particular work is unduly high.

It is from a combination of these and other causes that such large variations are frequently seen in tenders, and the following example is an illustration of the wide difference which may occur between the highest and lowest submitted. Tenders were invited for the painting of a large public building. Detailed bills of quantities were provided, and fourteen tenders were received. The highest tender amounted to £2,341, whilst the lowest was £775—a difference of nearly £1,600. The work was actually carried out for the amount of the lowest tender; and assuming that it was well and profitably executed, then the contractor sending in the highest tender must have considerably over-valued the cost of the work or anticipated making a very large profit.

As regards the execution of works, there are several methods of procedure open to the architect or engineer, each of which have some advantages under certain circumstances. The

usual method is to obtain tenders from builders and contractors by public competition based on detailed bills of quantities supplied for the purpose. A building contract is then entered into with the firm sending in the lowest or most suitable tender to execute the work at the prices mentioned. Where economy in first cost is of paramount importance this system of obtaining tenders undoubtedly provides the keenest competition and lowest prices, although it frequently involves a much greater amount of superintendence and trouble in securing a satisfactory standard of construction. Another method largely adopted when carrying out important works is to obtain tenders by means of a limited competition which is strictly confined to a number of well-known and reliable contractors in order to provide a reasonable assurance that the work will be executed in a proper manner and within the specified time. This course may possibly result in a slightly higher price being paid for the work owing to the elimination of the cutting practices adopted by some contractors, but such contracts are generally satisfactorily carried out, and without any friction.

In Scotland and the North of England it is a common practice to obtain separate tenders for each trade, so that in erecting an ordinary building the various works comprised under the respective headings of bricklayer, mason, carpenter, slater, plumber, painter, &c., are each carried out by a contractor or tradesman making a speciality of one of these trades. In this way buildings of an unimportant character may be erected at a comparatively low cost; for an enterprising working man with small capital will often undertake to carry out the works connected with his own particular trade, and at a minimum of profit as compared with a general contractor, who must make adequate provision for extensive plant and establishment charges.

In some cases building and engineering works are executed by means of a "schedule of prices." In this schedule a definite price is affixed to each item of workmanship and materials that may be required in the execution of the work. A copy of the priced schedule is supplied to each contractor tendering, who, after an examination of the work required and the prices quoted in the schedule, submits a tender stating the rate of percentage under or over the scheduled prices at which he is prepared to carry out the work. This system is extensively adopted for War Department and other Government works where contracts are required for executing incidental repairs and general jobbing work in connection with the maintenance of existing buildings. For works consisting largely of alterations and repairs this method provides a very convenient basis for a contract, instead of placing the work unreservedly in the hands of a builder without having any check upon the actual or ultimate cost of the work. In France a somewhat similar system of building contracts based on a certain percentage on or off a detailed schedule of prices is in general use for all descriptions of building works.

Another method of building by means of a schedule of prices is also sometimes adopted. A list or schedule of the various materials and workmanship which will probably be required in carrying out the particular work is supplied to each contractor, who then proceeds to fill in the prices at which he will execute such work. The disadvantage of this arrangement is that in the number of variously priced schedules received it is occasionally a difficult matter to determine which will provide the cheapest or most advantageous results, unless the approximate quantity of each item is known, so that a comparison may be formed by moneying out the items of the various schedules submitted.

Occasionally buildings are erected without the intervention of a contractor, the work being placed under the supervision of an experienced foreman or clerk of works, whilst the workmen are employed and paid direct, and materials purchased as required. Such buildings generally cost considerably more, and also occupy a much longer time in construction, than they would otherwise have done if executed by a general contractor under an ordinary building contract.

During the last twenty-five years the average rates of wages in the different building trades have risen considerably, whilst the number of working hours per day have been reduced. In

1876 a working week of fifty-four hours represented the average time worked in the London district, whilst forty-eight hours may now be taken as the average working week. The general increase in wages is apparent from an examination of the following comparative statement, namely:—

Comparative Table showing the Average Rates of Wages in the London District during 1876 and 1901.

Description of Trade.	Average rate per hour in 1876.	Average rate per hour in 1901.
	d.	d.
Bricklayer - - -	8½	10½
Carpenter or joiner - -	8½	10½
Excavator or navvy - -	5½	7½
Labourer, general - - -	5	7
Mason - - - - -	8½	10½
Painter - - - - -	7½	8½
Plasterer - - - - -	8½	11
Plumber - - - - -	9	11
Smith - - - - -	8½	10½

This increase in the rates of wages during the period mentioned, roughly speaking, amounts to about 25 per cent., and it is improbable that any permanent reduction in the present rates will become general, although of course fluctuations occur, according to the state of the building trade.

The following table gives the average current rates of wages for London and country districts respectively:—

Average Current Rates of Wages per Hour.

Description of Trade.	London.	Country.
	d.	d. d.
Bellhanger - - -	10½	8 to 9
Bricklayer - - -	10½	8 " 9
" labourer - - -	7	5 " 6
Cabinet-maker - - -	10½	8 " 9
Carpenter - - -	10½	8 " 9
" labourer - - -	7	5 " 6
Carter, carman or driver -	6½	5 " 6
Engine driver - - -	10½	8 " 9
Engineer or fitter - - -	10½	8 " 9
Excavator or navvy - -	7½	6 " 7
French polisher - - -	10	7½ " 8½
Ganger - - - - -	8	6 " 7
Gasfitter - - - - -	10½	8 " 9
" labourer - - -	7	5 " 6
Gilder - - - - -	12	9 " 10
Glazier - - - - -	10	7½ " 8½
Grainer or writer - - -	12	9 " 10
Joiner - - - - -	10½	8 " 9
Labourer, general - - -	6½	5 " 6
Mason - - - - -	10½	8 " 9
" fixing - - - - -	11½	8½ " 9½
" granite or marble -	11½	8½ " 9½
" labourer - - -	7	5 " 6
Painter - - - - -	8½	7 " 8
Paper-hanger - - -	9	7½ " 8½
Pavior - - - - -	10	7½ " 8½
Plasterer - - - - -	11	8½ " 9½
" labourer - - -	7	5½ " 6½
Plumber - - - - -	11	8½ " 9½
" mate - - - - -	7	5½ " 6½
Scaffolder - - - - -	7½	5½ " 6½
Sculptor or stone-carver -	16	12 " 14
Slater - - - - -	10½	8 " 9
" labourer - - -	7	5 " 6
Slate-mason - - - - -	10½	8 " 9
" labourer - - -	7	5 " 6
Smith - - - - -	10½	8 " 9
" labourer - - -	7	5 " 6
Stoker - - - - -	6½	5 " 6
Tiler - - - - -	10½	8 " 9
" labourer - - -	7	5 " 6
Watchman, day - - -	6½	5 " 6
" night - - - - -	6½	5 " 6
Well-sinker - - - - -	8	6½ " 7½
Zinc worker - - - - -	10½	8 " 9
" " labourer - - -	7	5 " 6

The foregoing rates are those generally paid by builders and contractors to experienced workmen, so that for all work executed by daywork it is necessary that an allowance of 15 to 20 per cent. should be added to these nett prices in

order to provide for the contractor's trade profit, use of plant, general establishment charges, superintendence, &c.

The number of hours comprised within an ordinary working week, as generally recognized in the building trades, varies according to the particular town or district, and also according to the season of the year. In the London district the scale recognized by builders and workmen (except for plumbers) provides for fifty working hours per week in the summer months; whilst for the fourteen winter weeks the hours worked are forty-seven hours per week for three weeks, commencing the first Monday in November, forty-four hours and a half per week for the next eight weeks, and forty-seven hours per week for the following three weeks. The working week is made up as follows:—

Time of Year.	Hours per Day.		Total Hours per Week.
	Monday to Friday.	Saturday	
Summer months	9	5	50
Winter—			
For three weeks commencing first Monday in November	8½	4½	47
For the following eight weeks	8	4½	44½
For the next three weeks	8½	4½	47

When workmen are required to work more than the regulation number of hours, extra pay must then be allowed for all overtime. The recognised rates are time and a quarter from ordinary leaving-off time to 8 p.m. (*i.e.*, each hour worked overtime is paid for at the rate of an hour and a quarter of ordinary time). From 8 p.m. to 10 p.m., at the rate of time and a half, and double time after 10 p.m. On Saturdays the pay for overtime is time and a half from noon to 4 p.m.; after 4 p.m., and also on Sundays, double time. Christmas day and Good Friday to be paid for at the same rate as Sundays. When workmen are sent more than 6 miles from the workshop to any building or work, an allowance of 6d. per day is made (exclusive of travelling expenses, time spent in travelling, and lodging money). For work in water, or interrupted by tides, an allowance of 25 to 50 per cent, is usually paid over and above the ordinary rates.

To ascertain the exact cost of the labour required in connection with any particular work it is necessary to know not only the local rates of wages but also the average quantity of work which an ordinary workman will execute under normal conditions. For instance, an excavator or navvy working for ten hours should, under ordinary circumstances, dig and throw out about 8 cub. yds. of common ground. For the sake of convenience such results, as obtained from actual experience, may be brought together in a systematic and tabular form, so that these "constants of labour," as they are called, are then ready for convenient reference at any time. The amount of work which can ordinarily be performed in ten hours is sometimes adopted as a basis of comparison, but for ordinary practice it is much more convenient to take the amount of work performed in one hour as the standard unit in the compilation of a table of constants of labour. Under this system the constant of labour for an excavator digging in ordinary ground as already described would be '8, that is, an excavator is presumably capable of digging '8 cub. yds. of earth per hour in the performance of a fair day's work. The average cost of labour in connection with any description of work is readily found by multiplying the labour constant by the local rate of wages per hour. For instance, assuming that excavators are paid 6d. per hour, then the nett cost of labour digging in common ground would be as follows:—

labour constant × rate per hour

$$'8 \times 6 = 48d. \text{ per yd. cube.}$$

on the other hand, taking the local rate of wages for excavators at 7d. per hour, then the estimated prime cost of this description of work is—

$$'8 \times 7 = 56d. \text{ per yd. cube.}$$

When the items include both materials and labour, the actual cost of the required materials added to the cost of labour will give the nett or prime cost of the work. In all cases of prime cost values of materials and labour, it is necessary to add an allowance (usually 10 to 15 per cent.) for contractor's profit, establishment charges, &c., in order to arrive at the proper market or selling value.

(To be continued.)

New Patents.

These patents are open to opposition until July 7th.

1901.—Automatic Door Openers.—6,340. W. P. THOMPSON, 6, Lord Street, Liverpool (communicated by the Perfect Sliding Door Co., 329 & 331, Homer Laughlin Building, Los Angeles, U.S.A.). Instead of the door being opened by hand, this is done with the foot, so that the person can pass through without stopping, the door closing automatically behind him. The necessary levers are operated by a tread-plate let into the floor and on which the person walks.

Carving Machines.—9,100. J. GATES, 57, Yerbury Road, Tufnell Park, London, N. The tools are in pairs moving in opposite directions towards and away from the centre line of the work, so that only a half-pattern is necessary. The machine is also arranged so that the tools can be turned in any direction.

Kilns.—9,238. J. H. SMITH, 151, Moorside Street, and F. SMITH, 1, Rutland Street; both of Droylsden, Manchester. The flues connecting the kilns are so arranged that by opening and closing certain dampers the heat from one kiln is forced down through the other kiln, and *vice versa*; thus, as one kiln is cooling its waste heat is utilised in heating the other kiln. An economy of fuel results.

Water-Closets.—10,142. J. SHANKS, Tubal Works, Barrhead. The discharge leg of the syphon is cast with the body of the cistern. The cover is in two parts, one carrying the lugs or brackets for the syphon-actuating lever. The usual well part is inverted so that it projects entirely within the body of the cistern.

Iron or Steel Chimneys.—11,024. F. S. CRIPPS, 71 and 72, King William Street, London, E.C. The chimney has an inner and an outer cylinder filled between with slag wool so as to prevent radiation and the consequent cooling of the gases, and so as to allow a shorter chimney to be used without impairing the draught. This more especially concerns the chimneys used in connection with retort benches in gasworks.

Flexible Sheets for Columns, Walls, &c.—11,150. J. WETTER, 37 and 39, Essex Street, Strand, W.C. (communicated by O. Mack, Ludwigsburg, Wurtemberg). The sheet consists of a base of woven textile fabric and a series of slats or bars of plastic mineral substance. The feature of the invention is that the sheets can be rolled up very closely.

Stock Bricks.—14,655. BECKENHAM AND PENGE BRICK WORKS, LTD., Kent House Road, Beckenham; and G. N. POCKNALL, secretary of the company. Powdered chalk (with or without lime) is mixed directly with the clay and water added to give the required consistency. In this way the labour of the winter preparation is avoided and a better brick can be made at far less expense.

1902.—Latrines.—1,296. M. J. ADAMS, 72, Park Lane, Leeds. The trough is oblong in section and narrower than the seat holes, at which points it is enlarged, thus saving space and water.

Ventilating Underground Railways.—7,133. R. J. RUSSELL, 106, Finsbury Park Road, London, N. The lift is treated as a plunger and the shaft as a cylinder. Air is thus forced in.

The following specifications were published on Thursday last, and are open to opposition until July 14th. A summary of the more important of them will be given next week. The name in italics is that of the communicator of the invention.

1901.—6,865, COOPER, chimney pot and ventilator. 9,136, LANE (*Brown*), locks and fastenings. 9,599, TENOW & FLODSTRÖM, lumber raising or lowering apparatus. 9603, STOLLE-

WERKE, organs. 9,617, DAVIS, machine for preparing evenly-gauged test briquettes, and for making bricks from powdered materials. 10,468, WALLIS-TAYLER & WHITEHEAD, doors for cold stores. 10,543, CHATWOOD, strong-rooms. 10,614, COALES, manholes of sewers. 11,279, KROMER, locks. 11,584, HEDGES, lightning conductors. 11,743, SCOTT, steam cranes. 11,917, BASSETT, spigot and socket joints for sanitary appliances. 12,835, STOTHERT & PITT, LTD., & STOTHERT, electric cranes. 13,035, GABRIEL, treads for stairs. 13,793, PASSOW, process for producing cement. 14,935, NAYLOR & NAYLOR, stoneware pipe joints. 17,596, LEES, T-squares and drawing-boards. 21,287, JABLONOWSKY, hoisting devices.

1902.—3,606, BERRY, manufacture of concrete slabs or blocks. 5,975, DEMPSEY, machine for packing the ground and for mixing sand, water, and cement to form concrete, &c. 7,264, RICHARDS, planes.

MESSRS. DOULTON'S EXHIBITION.

AN exhibition of recent art productions by Messrs. Doulton & Co. is open till June 14th at their Lambeth works from 2 p.m. to 5 p.m. Here is arranged a great variety of pots, vases, plaques and other similar work, various tile exhibits, and some panels in terra-cotta modelled by Mr. George Tinworth. The last are the most important, and consist of "The Entry of the Apostle Paul into Rome," "The Shepherds coming to worship the Infant Saviour at Bethlehem," and "The Wise Men opening their Treasures." These panels are in very bold relief, the figures in the foreground being quite complete and distinct from the background into which the other figures gradually merge. The effect on the whole is good, especially under the admirable system of lighting adopted. Of tile and faience work there are several pleasing examples. An experiment has been made with what has been tentatively named "stoneware polychrome," and a small panel is exhibited of "Moses on Mount Pisgah," the design having been adapted from Lord Leighton's well-known black and white drawing; in this Mr. J. H. McLennan has been very successful. Of Lambeth faience there are shown many examples of floral and conventional decoration. By this process the painting is executed on an already baked surface, and is then covered with a deposit of glaze which requires a second or third firing to render it transparent. Some large faience tile panels by Miss Thompson are exhibited. One—"The Babes in the Wood"—has been designed for a children's hospital; and in this connection it may be mentioned that Messrs. Doulton are now engaged on a set of similar panels for one of the London hospitals and have recently completed the decoration in this manner of a ward in St. Thomas's Hospital. Examples of vitreous fresco, in which the method is that of faience having a matt surface instead of a bright glaze, have been exhibited before: those now shown are, however, very pleasing in colour. The subjects are taken from Malory's "Quest of the Holy Grail," and have been jointly executed by Mr. Arthur E. Pearce and Mr. J. H. McLennan, the former having designed the cartoons and the latter carried them out on terra-cotta slabs. A prominent feature in the exhibition is a double grille enclosure in glazed faience, Moorish in style, but it is too gaudy a piece of work to be pleasing. Other exhibits include an entirely new series of models for garden ornaments in unglazed terra-cotta, including sundials, fountains, pond-edgings, vases, &c.—very effective, and some examples of Parian painted work and vitograph; the latter is a new kind of decoration consisting of solid vitreous tiles with a surface painting, the special feature of which is that the tint of the tiles themselves, without any added glaze, gives a prominent note in the scheme of colour. A portal is formed immediately within the show-room of two fluted columns of Persian design with conventionalized Bull-capitals. This is a replica of the lower part of the Dalal Gateway recently erected in the Parsee burial-ground at Brookwood under the joint direction of Mr. Arthur Mersey and Sir George Birdwood. Included in the exhibition is a potter's wheel around which one may stand and watch the magic transformation of the clay in the deft fingers of the workman.

Keystones.

Mr. Joseph Brattan, architect, of Birkenhead, died recently at the age of seventy-nine years.

A New Volunteer Drill Hall at Slough has been erected at a cost of £7,500 by Mr. Bowyer, of Slough, from designs by Messrs. Ravenscroft, Son & Morris, architects, of Reading. The materials used are stone, terra-cotta, brick and slate.

A Congress of French Architects was opened in Paris last Monday, and will be continued until Saturday. The sittings take place in the School of the Beaux-Arts, and visits will be made to several public and private buildings in various districts.

A New Lunatic Asylum at Bloemfontein is to be erected. The final choice of plans rested between the designs furnished by a local architect and those of Mr. S. A. Eddy, late of Tuckingmill, Camborne. The merits of the designs were so even that the premium of £100 was divided between the two competitors.

The Monument to the Memory of Charles Garnier will be inaugurated in October. The bust of the architect of the Opéra will be executed by Carpeaux, while the accompanying allegorical figures will be the work of M. J. Thomas, member of the Institute, and formerly at the Villa Médicis, a comrade of Garnier.

A Tower for the Church of the Society of St. John the Evangelist at Oxford is being erected. The original designs of Messrs. Bodley & Garner provided for a building to cost about £12,000. It is six years since the church was dedicated, and as there was a difficulty in raising so large a sum the erection of the tower was left for a future date, it being estimated that this portion of the work would involve an expenditure of £3,000.

A New Screen and Lectern have been placed in Warcop Church. The screen is on the north side, and forms a new vestry. It is of panelled oak, with open carved panels at the top. Inside the vestry is wainscoted with oak. The lectern is in light oak, and consists of a richly-carved octagonal pillar, supported by four carved flying buttresses. The desk is supported by a cherub. The lectern was the work of Messrs. Harry Hems & Sons, Exeter, and the screen of Messrs. Slinger & Gowling, Appleby.

The Richmond Hill (Preservation of View) Bill was approved by a majority of 100 in the House of Commons last week, and passed its third reading. Mr. Labouchere strongly objected to the Bill, which he said was one to enable the landlord, Lord Dysart, to build over certain land. Mr. John Burns contended that Lord Dysart, by conceding shadowy rights which he could not possibly maintain, obtained the valuable asset of 176 acres of Lammas-land under Richmond Hill which in a few years' time would be worth £2,000 per acre for building purposes.

Memorial to a Bishop.—In the crypt chapel of St. Paul's a marble slab has been placed over the grave of Bishop Creighton. It has been executed by Messrs. Powell & Sons from designs by Mr. James Powell. The design is based on the old slabs in Italy, specially in Siena Cathedral. It is almost unique in England, and the Bishop is represented in cope and mitre with his pastoral staff in his hand. The slab itself is of white marble, the cope of Verona red marble, and the shields in the border let in in Siena marble, the whole being incised in black line. The pastoral cross and ring are brought out with blue-enamel.

New Public Offices in Dublin.—A Bill for the erection of a College of Science and new offices for the Irish Local Government Board in Dublin was read a second time in the House of Commons last week. To the second part of the proposal great objection was taken by the Nationalist Party on the ground that the Local Government buildings were to be placed in the forefront facing Upper Merrion Street, and that the College of Science was to be in the background and in a side street, while Lord Balcarras warmly protested against the architectural features of the scheme as a whole and against the plans, which would prevent the extension of either the museum or the College of Science.

A New Town Hall at Walsall is being erected at an estimated cost of £100,000.

The Royal Box at the Military Tournament has been furnished and decorated by Messrs. Oetzmann & Co., of Hampstead Road, N.W.

On the Site of Temple Bar two Coronation arches are to be erected, one to the west and the other to the east of the Griffin. They will be of imitation stonework.

More Carnegie Libraries.—Mr. Andrew Carnegie has promised a contribution of £10,000 towards the building of public libraries in the borough of Greenwich.

At St. Philip's Church, Dalston, another single-light window has been erected. The subject depicted is the Good Shepherd, under a canopy of the fourteenth-century style. The work was carried out by Messrs. Morris & Sons, of Kennington Road, London.

In the Church of St. Peter-upon-Cornhill a tablet has been placed to the memory of the late rector, Prebendary Richard Whittington. The memorial, which has been designed by Mr. Ernest Flint, F.R.I.B.A., 80, Coleman Street, is composed of gun-metal, the pedimented top bearing the arms of the Whittington family, while the inscription is outlined by a classic border of laurel leaves.

The Scheme of Decoration for Westminster Bridge has now been finally settled. Two huge modelled lions on high pedestals will guard each approach to the bridge, and in the centre of each of the seven arches, close to the parapet, will be placed lofty pillars surmounted by busts of British sovereigns. The places of honour over the centre arch have been assigned to Queen Victoria and Queen Elizabeth. The pedestals on which these two busts will stand will differ from the rest in being adorned with finely-modelled winged figures holding laurel wreaths above their heads, and each having two cherubic children seated at their feet. Along the parapets of the bridge will be erected tall masts topped with imperial crowns. The roadway will be left quite clear.

The Devon and Exeter Architectural Society's annual meeting was held at Exeter on Saturday week. In the absence of the president (Mr. H. G. Luff, A.R.I.B.A., of Devonport) Mr. J. M. Pinn occupied the chair. The annual report and balance-sheet was very satisfactory. Mr. W. W. Hitchins was awarded the book prize for measured drawings. Mr. J. M. Pinn was elected president for the ensuing year; Mr. A. S. Parker, A.R.I.B.A., vice-president; Mr. Harbottle Reed hon. secretary; Mr. O. Ralling hon. treasurer; and Messrs. Bridgman, A.R.I.B.A., I. Crocker, F.R.I.B.A., and L. Tonar new members of the council. At the close of the meeting a visit was paid to the septic tanks at Belle Isle, where the deputy surveyor, Mr. Moulding, and the sanitary inspector, Mr. Wreford, conducted the party over the works, and afterwards the new church at St. David's was inspected under the guidance of the vicar, the Rev. C. J. V. French.

Cambridge.—In the course of a paper on Cambridge which he read before the recent meeting of the Surveyors' Institution in that city, Mr. H. M. Jonas, F.S.I., spoke of the sanitation, the paving, the lighting, the water-supply, the public improvements which had been effected, and the colleges. In the sixteenth century the accumulation of filth in the streets of Cambridge resulted in plague and sickness. At the present time the town was one of the most healthy in England, and a new sewage system on the precipitation and irrigation principle has just been completed at a cost of about £168,000. As to the paving, the successive stages of macadam, granite setts and asphalt are now giving way to wood blocks, which have recently been laid down from the station to the post-office, a distance of 1,830 yds., at a cost of £15,517. The electric lighting company of Cambridge is one of the few in England paying a dividend of 7 per cent. The system adopted is high-tension alternating, the dynamos being driven by Parson's steam turbines. The present water-supply is derived from the lower green sand and is pumped up at Fulborn, six miles away, to a reservoir above Cherryhinton, the height giving sufficient head of water to deliver a jet from a standpipe over the top of King's College Chapel.

A Side Chapel is to be erected in St. James's Parish Church, Grimsby, as a memorial of the late Canon Young, vicar of Grimsby, from designs by Mr. Bodley, R.A.

The New Municipal Hall of the City of Westminster, which, situate in Charing Cross Road, was originally the town hall of the parish of St. Martin-in-the-Fields, was opened last week. Extensive alterations and additions have been made in the building including the construction of a handsome council-chamber and commodious offices, the work being carried out by Messrs. Patman & Fotheringham, Ltd., under the direction of the architect, Mr. John Murray, F.R.I.B.A., at a cost of about £30,000.

A Gateshead Competition.—The Gateshead School Board at a recent meeting considered competitive plans for the proposed school at Chester Place. The three plans marked "Gloucester," "Ely" and "Canterbury" were selected as the best, and on the envelopes being opened the authors were found to be (1) Mr. F. W. Purser, West Street, Gateshead; (2) Mr. Stephen Piper, Newcastle; and (3) Mr. H. T. Hodges, Newcastle. The Board resolved to erect a temporary iron building to accommodate about 400 children, and to delay proceeding with the permanent school.

Old London Houses: Records Wanted.—The clerk to the London County Council has sent to the Royal Institute of British Architects a list of houses in various parts of the metropolis which are to be demolished for housing and other purposes. This list is published in the Institute Journal for May 31st. The Council is desirous that a record (in the shape of photographs, drawings, &c.) may be kept of any of these premises which have either historical associations or features of architectural interest, so that any available matter should be sent to the secretary of the Institute at 9, Conduit Street, W.

A New Chapel at Girton College, Cambridge, has been added to the college buildings. Further additions will be made to the college during the summer, when accommodation will be made for 200 students. Like the rest of the college fabric, the chapel is from the designs of Mr. Alfred Waterhouse, R.A., and Mr. Paul Waterhouse. Within it is very simple, with a wooden roof, having hammer-beams that terminate with carved shields, and these, as well as the oaken panelling of the chancel and inscription over the entrance (*Huc usque auxiliatus est nobis Dominus*), are the work of former and present students of the college.

Birmingham's New Theatre.—It is proposed to rebuild the Theatre Royal, Birmingham. The original idea was to rebuild the whole of the huge block of buildings surrounding the historic play-house in New Street, to make a grand arcade through the centre of the site, to erect shops, offices and bachelors' flats, and to build a palatial restaurant. The obligations the magistrates have imposed upon the proprietors, and the fact that the undertaking would have involved £8,000 a year in ground-rent alone, have led to some retrenchment and to an entirely new set of plans being made. The arcade scheme has been abandoned and the site rearranged. The new theatre will have its main elevation in Stephenson Street, and its chief entrance close to Lower Temple Street.

A New Presbyterian Church at Muswell Hill, N., is being erected in Perpendicular Gothic style. Externally the building is faced with whole white flints, the dressings being of red terra-cotta. The plan approximates in form to a Greek cross. The ceiling internally is vaulted, the large central vault being carried up higher than the others for effect and better ventilation, and is carried upon clustered granite columns with moulded stone bases and carved stone capitals. These support four main moulded arches and other smaller ones spanning to the walls. The windows are all filled in with ornamental lead lights. Electric lighting and low-pressure hot-water heating apparatus will be used. The seating accommodation is—on ground floor, 615; in choir, 34; in end gallery, 81; total, 730. The contract is let to Messrs. Johnson & Co., Belle Vue Road, Wandsworth Common. The architects (whose designs were accepted in a recent competition) are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C.

Holy Trinity, Micklegate, York.—The whole of the work (plumbing and glazing excepted) in connection with the restoration of Holy Trinity Church, Micklegate, York, for which Mr. C. Hodgson Fowler, Durham, is the architect, has been entrusted to Mr. Anthony Lyons, builder, of Norton Malton, who has also secured the whole of the work (plumbing and glazing, and carpenter and joiner excepted) in connection with the new church of St. Barnabas, Foundry District, for which Messrs. Hornsey & Monkman, York, are the architects.

The New Passmore Edwards Hall in Clare Market, London, W.C., was opened last week. The building is to be the habitation of the London School of Economics and the British Library of Political Science, in connection with the University of London. The building has been designed by Mr. Maurice B. Adams; the design was illustrated in our issue for July 11th, 1900. The cost of the whole has been more than £30,000, towards which sum Lord Rothschild gave £5,000. The walls are wainscoted, like the staircase and upper hall. The furniture in the library has been carried out in Hungarian oak left plain from the tool. Specially-designed chimney-pieces were made to suit the large proportions of the classrooms.

The Canadian Coronation Arch is designed on unconventional, yet decorative, lines, a distinctively architectural treatment being deemed undesirable in a structure which is obviously ephemeral, and which is to form a background for a representation of the cereal products of the Colony. The height is 56ft., and the width 60ft.; the arched opening in the centre being 25ft. wide, flanked on either side by open octagonal features draped and festooned, the whole structure being capped by an open lantern with roof of crown formation. An illumination scheme has been designed whereby the main features of the structure will stand out after dark. The design is by Messrs. Walker & Ramsay, of Glasgow, the architects for the Wolverhampton Exhibition. The arch will be in Whitehall, opposite the bronze statue of James II. and below the Horse Guards. It will be constructed of plate-glass.

The New Operating Theatres at the London Hospital, Mile End Road, E., have cost £13,000. Mr. Rowland Plumbe, F.R.I.B.A., was the architect. The new department is situated on the third floor of the old front block of the hospital, and consists of a theatre, four operating-rooms, three anaesthetising rooms, four recovery-rooms or small wards, five operation wards, rooms for sisters, nurses and attendants, an instrument- and sterilising-room, surgeons' rooms, and examining-rooms and dressers' lavatory. A wide central corridor runs the whole length of the block, served by three lifts. The whole of the floors are in marble mosaic, and the walls and ceilings lined with Opalite, all angles being rounded. The fittings are most elaborate, every requirement being provided for, and all the details arranged on the most modern and approved principles. The whole department is lighted with electricity, and great attention has been paid to heating and ventilating.

The Architectural Association of Ireland held its last general meeting of the session on May 27th. The president, Mr. C. J. McCarthy, Dublin city architect, presided. The following new members were elected:—Daniel E. Synan and W. James Egan. The results of the competitions were then announced: the Doolan prize, for the best sketch—one competitor, Mr. John Knox Vinycomb; the Beckett prize, for best water-colour drawing—F. H. Tallon, the only competitor. For the Science and Art Lectures prizes no award was made, there being but one competitor. Class of design—first prize, F. H. Tallon; second prize, J. Hamilton Barlee. The following officers for the ensuing year were elected:—President, Mr. F. G. Hicks; vice-presidents, Messrs. R. M. Butler and J. Howard Pentland; committee: Messrs. E. Bradbury, T. Coleman, J. Geoghegan, F. Hayes, Joseph Holloway, C. J. McCarthy, C. H. Mitchell, L. O'Callaghan and G. P. Sheridan; treasurer, J. H. Webb; librarian, Mr. Cullimore; secretaries, Messrs. Beckett and Millar; auditors, W. F. Beckett and M. J. Buckley.

Engineering Notes.

The Additions to the Beckett Hospital, Barnsley, have been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent Manchester stoves.

An Esplanade and Promenade Pier at Aberavon has been opened at a cost of £4,000. The pier is 1,500ft. long and the esplanade 640ft. The contractor was Mr. T. Scott, of Rugelan, near Motherwell, and the engineer Mr. D. Roderick, borough surveyor.

The London United Tramways Company intends to apply to the Light Railway Commissioners for power to extend its system of electric tramways to Colnbrook, Slough, Taplow and Maidenhead, with branches connecting the Great Bath Road with the Great Western Railway at Langley and the South-Western Railway at Datchet-on-Thames.

Partnership.—Mr. S. Yates Edwards, late of Messrs. McCleod, Edwards & Co., Liverpool, has entered the firm of M. A. Potts & Co., British and American contracting engineers, Manchester, England, and Reading Pa, U.S.A., as partner, and will act as general manager in this country. This company has also appointed Mr. H. Burke, C.E., as their resident engineer in this country.

Battersea Park Road Bridge, carrying the West London Extension, G.W.R., over Battersea Park Road, has recently been successfully replaced. Preparatory to the old bridge being removed the whole of the new work was built together on staging at the side of the old one. It was arranged to make the transference on a Sunday. After the last train had passed over the old bridge at 2.25, the permanent way was cleared, and at 4.30 the new bridge weighing 100 tons was moved into its final position by means of trolleys and hydraulic gearing. The new bridge consisting of plate girders 80ft. long, connected with cross girders, and trough flooring, has been made and erected by Messrs. Andrew Handyside & Co., Ltd., of Derby.

Lightning Conductors: Some Further Remarks.—On p. 227 of our issue for last week we published some remarks by Mr. Killingworth Hedges on the subject of lightning conductors. A correspondent of the "Standard" makes the following additional observations in regard to the very important matter of earth-plates and connections:—(1) The conductor should be of only one kind of metal from earth-plate to point; if of iron, the pieces welded, an easy process by electricity; if of copper, very hard brazed, with protection of brazed part against decay. (2) Where joints are unavoidable, care is to be taken not only that the electrical connection is sound at the time, but that without attention it will be likely to remain so. (3) An easy means is acquired of testing the connections between each earth-plate and its lead above ground.

Civil and Mechanical Engineers' Society.—The annual dinner of this Society was held at the restaurant Frascati on Thursday evening last, the president, Professor Robert H. Smith, Wh.Sc., A.M.I.C.E., M.I.M.E., occupying the chair. After the royal toast had been given, Mr. R. E. Middleton, F.S.I., proposed "The Navy, Army and Auxiliary Forces." Col. R. E. Compton, C.B., responded. He spoke of the engineering status of the Army, which he said had greatly improved, and he looked forward to the time when land transport for war purposes would be carried on by machines and not by horses, large numbers of which—as in South Africa—when lying dead became a great offence. The toast of "The Society" was proposed by Mr. G. F. Emery, LL.M., who referred to its flourishing condition after a life of nearly fifty years. Mr. B. B. Badley, A.M.I.C.E., responded. Mr. J. Bridges Lee, M.A., gave the toast of the "Kindred Societies," Professor John Perry, D.Sc., F.R.S., responding. This was followed by the toast of "The President" (proposed by Mr. W. R. Galbraith, M.I.C.E.) and finally that of "The Ladies."

The Institution of Junior Engineers recently paid a visit to the Great Eastern Railway Works at Stratford, by the courtesy of the locomotive superintendent, Mr. James Holden, M.I.C.E. In the locomotive machine shop, automatic bolt machines and general machinery for deal-

ing with locomotive work were shown. Large planing machines, &c., were in operation in the erecting shop, where locomotives, both new and repaired, were in various stages of construction; in this shop also pneumatic tools were seen tapping and drilling. Pneumatic tools were also at work in the boiler-shop, and hydraulic riveters and flanging machines, together with general machinery appertaining to boilerwork. The brass foundry contains a pneumatic moulding machine, and in the brass finishing shop above it are special lathes for manufacturing brass details and firebox stays, &c. The party also visited the locomotive department, the Westinghouse brake shop, smith-shop, wheel-shop and iron foundry. In the carriage department new main line composite carriages and suburban carriages were seen in the process of widening, so as to carry two extra passengers per compartment. The sawmills, which contain a large variety of woodworking machines, were also visited. A visit was also made to the running sheds, liquid fuel storage, engine paint shop, and oil gasworks.

Surveying & Sanitation.

Sanitary Examinations.—The council of the Society of Architects have granted exemption from the sanitary section of their membership examination to gentlemen who have passed the examination qualifying for Fellowship of the Institute of Sanitary Engineers.

The Widening of Piccadilly between the Circus and Sackville Street came up for discussion again in the House of Commons last week, in the course of which Mr. A. Chamberlain said that, though the shortest leases of the property concerned had twenty and thirty years to run, it was hoped that the arrangements which had been made might facilitate the widening at an earlier date.

Mr. W. H. Fox, borough surveyor and engineer, of Barrow, died recently. He was at one time surveyor under the old Dalton Local Board, being appointed to his last post in 1879. The pumping station at Salthouse was erected from his designs, and he carried out an elaborate scheme for the disposal of sewage by means of deep-water outfalls. He also executed two bridges, laid out the borough, and initiated the scheme of tapping the Duddon to ensure the town a permanent and adequate water-supply.

New Ordnance Survey Maps.—There have been prepared for publication from the Ordnance Survey Office at Southampton the first of a new series of maps of Great Britain. The revised map of the British Islands, on the scale of 1 in. to the mile, is, of course, deservedly popular, but the scale is somewhat large for the purpose of those who require a map which shall at once show considerable detail and cover a wide area, without being too bulky. Accordingly in 1898 was begun the revision of the outline map of England and Wales on the scale of four miles to the inch. The new departure of the Ordnance Survey consists in the issue of coloured maps on this scale for both England and Scotland, showing the chief surface features of the two countries with commendable clearness. The 1 in. map has been issued with the hills in black and brown, and several sheets on the same scale have been published in colours. The War Office, however, attaches great importance to the four-mile map, and the new series was primarily designed for the convenience of the military authorities. At the same time, it should be useful for many civil purposes. The maps are printed in five colours. Outlines and names are printed as usual in black; seas, rivers, and lakes in blue; hills in light brown; large woods in green, and the main roads in burnt sienna. Especial interest attaches to the method of representing hilly and mountainous country which has been adopted. Stipple shading by photo-etching has been introduced for the first time in connection with Ordnance Survey maps. The result is satisfactory. The method is not, of course, to be preferred to the representation of elevations by contours, but the scale of four miles to the inch is too small to allow of contours being shown in a satisfactory manner, and the new

maps really afford a very graphic presentation of the orographical features of the country. The map of England and Wales will be published in twenty-five sheets, which will be sold unmounted at 1s. 6d. each; that of Scotland will be complete in seventeen sheets of slightly smaller size, to be sold at 1s. each. Combined sheets, folded and in a cover, are shortly to be issued, so as to show in one map one or more counties or some other convenient area.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRENTWOOD (ESSEX).—For the erection of a residence, Brook Street, for Mr. W. H. Roscoe. Mr. Arthur T. G. Woods, M.S.A., architect, Brentwood:—

A. W. Robins, Wanstead...	£1,805
Hammond & Son, Romford...	1,787
Hammer, Baintree...	1,845
A. Gozzett, Romford...	1,505
H. Potter, Chelmsford...	1,675
F. Wilmott, Ilford...	1,538
Burtwell & Jarvis, Brentwood...	1,445
Harris & Rowe, Shoeburyness...	1,400

* Accepted.

GLOUCESTER.—For removing existing skylights, louvers, and slates from the roof of the Eagle Market, making good existing boarding where required, felting, lathing, and counter-lathing, and re-nixing slates, making good with new where required; also for fixing new skylights, louvers, and lantern lights with patent glazing, for the Corporation. Mr. R. Read, A.M.I.C.E., city surveyor:—

Freeman & Jones...	£1,393 10 11
A. King & Sons...	1,348 0 0
J. Gurney...	1,311 12 2
J. Byard & Sons*	1,148 0 0

* Accepted. [All of Gloucester.]

HAMERTON, HUNTS.—For the erection of a parish room, for Mr. J. M. Howson. Mr. S. Inskip Ladds, A.R.I.B.A., architect, Market Place, Huntingdon, and London:—

A. Pettit, Godmanchester...	£505
W. Howard, Huntingdon...	545
Page & Son, Buckden...	530
C. R. Pettit, Thrapston...	497

* Accepted.

HULL.—For alterations and additions required at the workhouse, Beverley Road, Hull, for the Guardians of Sculcoates Union. Mr. T. Beecroft Atkinson, architect, 11 Trinity House Lane, Hull:—

Bricklayer and plasterer.

F. Southern...	£3,519 3 0
I. J. Kirkwood...	3,468 1 2
J. R. Woods...	3,340 10 6
T. Gontes...	3,315 0 0
M. Harpe...	3,247 18 0
F. Singleton...	3,200 0 0
J. Houlton...	3,208 10 6
F. Beilby...	3,048 0 0
Hull General Builders...	2,900 0 0
J. Carr, 69 Chornley Street, Hull...	2,845 10 6

Joiner.

G. W. Stephenson...	2,143 0 0
Simpson & Son...	2,100 10 0
Hull Joiners...	2,035 10 10
Hull General Builders...	1,710 15 0
W. Turner...	1,600 0 0
G. H. Scorer...	1,600 0 0
H. Kaye...	1,625 0 0
H. Neal...	1,612 0 0
F. Singleton, 81 Witham, Hull...	1,490 0 0

Electrical engineer.

C. Wokes & Co.	140 0 0
King & Co.	90 0 0
A. Reame & Co.,* Hepworths Arcade, Hull...	61 10 0

Slater.

Wilde & Sons...	212 0 0
Dawber, Townsley & Co.	211 0 0
Smith & Hunter...	210 0 0
H. Williamson & Co.	207 13 0
Hull General Builders, Lockwood Street, Hull...	150 12 6

Plumber.

C. Ashton...	710 16 8
N. Lawson...	700 0 0
F. Blashill...	692 3 8
Wright & Fillingham...	689 9 0
W. G. Padgett...	680 4 6
W. L. Harrison...	680 0 0
W. H. Smith...	671 7 0
R. H. Kenningham...	669 10 7
Atkinson & Son, Carr Lane, Hull...	647 0 0
J. Morley...	620 19 3

Stonemason.

T. W. Wrigglesworth...	390 0 0
G. Porter...	380 15 7
F. Sweeting...	379 13 0
G. H. Pantou...	277 10 0
J. Peers...	272 0 0
Q. Ribbel & Son, 40 Fountain Road, Hull...	259 0 0

Painter.

R. Johnson...	238 10 0
W. C. Drewery...	140 10 0
Stephenson & Christopher, 423 Pryne Street, Hull...	120 0 0
F. Fellows...	100 17 1
E. Good & Son, whole tender...	7,490 6 11
V. Knowles, bricklayer, plasterer, and joiner...	5,334 8 6

* Accepted.

LONDON.—For alterations and additions to West Hill Lodge, Sydenham, S.E. J. Randall Vining, architect and surveyor, 80 Chancery Lane, W.C.:—

A. Black & Son...	£521
J. Marsland & Son...	407
J. & C. Bowyer...	403

* Accepted.

LONDON, S.W.—For the construction of a concrete river wall, about 1,000 ft. in length, in connection with the Fielder's Meadow extension of Bishop's Park, Fulham, facing the River Thames, and adjoining Putney Bridge, for the Fulham Borough Council. Mr. Francis Wood, A.M.I.C.E., F.G.S., engineer and surveyor:—

Facey & Son...	£14,070 9
G. Osenton...	13,132 0
F. Osman...	12,800 0
J. Dixon...	11,904 0
C. Chane & Sons...	11,350 0
F. G. Minter...	11,130 0
Mayoh & Haley...	10,500 0
C. Ford...	10,238 0
J. Mears...	10,000 0
T. W. Pedrette...	9,500 0
Cooke & Co.	9,502 0
Nowell & Co.	8,875 0
H. J. Greenham...	8,765 0
Parry & Co.	8,375 0
G. Wimpey...	8,345 0

Borough engineer's estimate, £11,200.

SITTINGBOURNE.—For the construction in Sittingbourne of about 10 miles of stoneware and iron pipe sewers and effluent water outfall, with manholes, storm overflows, ventilators, ejector chambers and ejectors, cast-iron rising mains, cast-iron air mains, and other works connected therewith; also sewage tanks and filters, engine and boiler houses, chimney shaft, workshop, store, offices, cottage, roads, fencing, and other works connected therewith for the collection and disposal of the sewage of the district, together with the maintenance of the works for 12 calendar months after completion, for the Sittingbourne Urban District Council. Mr. J. C. Mellis, M.I.C.E., engineer, Gresham House, Old Broad Street, E.C.:—

G. Osenton, Westerham, Kent...	£50,805 0
Kemp, Bros., Rainham, Kent...	53,480 0
W. Manders, Leyton...	51,000 0
F. W. Trice, Enfield...	50,010 0
H. Brown, Watford...	46,878 0
J. Jackson, Plaistow...	40,598 11
W. Jones & Son, Neath...	40,463 0
J. & T. Binns, Croydon...	44,118 0
Wilkinson Bros., Finchley Park...	43,505 0
Peerless, Dennis & Co., Eastbourne...	42,450 0
Munday & Sons, Trinity Square, E.C.	42,150 0
B. Cooke & Co., Westminster...	41,300 0
A. Braithwaite & Co., Leeds...	40,900 0

* Accepted.

Trade and Craft.

A New Cleaning Process for Decorators.

A demonstration was given last week, at the Alhambra Theatre, of Booth's patent process for the complete removal of dust from carpets and upholstery. The invention is a most admirable one. The dust is sucked out by means of a vacuum, without injury to the fabrics and without removal or unpicking. The process will especially appeal to architects, decorators and builders entrusted with cleaning and redecoration works, as not only is the work of dust-removal completely done, but the cost of taking up and relaying is saved, and in many cases renewal is avoided. The cleaning agent is air. A vacuum is established by means of an air-pump operated in a portable truck, which carries the entire plant, and the suction of air created by this means is carried to the carpet or furniture being treated through flexible india-rubber tubes, with the result that by passing the cleaner over the floor, the dust contained in and under the carpet is drawn up by the suction pressure and is removed along the tube to a filter attached to the truck, where the dust is collected and deposited. The quantity of dust removed is remarkable; in one case 49 lbs. were taken from a carpet just under 200 sq. yds. in area. The process, too, has a sanitary value, as sweeping causes the dust deposit to circulate in the air, to the detriment of the internal decoration, whereas by the use of this apparatus the atmosphere is kept pure. In hotels, theatres, large restaurants and business establishments, the company install permanent stationary plants, preferably in the basement, from which wrought-iron pipes of small diameter lead to fixed points on each floor where cleaning is required. No skilled operators are required. The address of the Vacuum Cleaner Co., Ltd., is 25, Victoria Street, S.W.

COMING EVENTS.

Wednesday, June 4.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Meeting at 8 p.m.

BRITISH ARCHEOLOGICAL ASSOCIATION.—Rev. H. J. Dukinfield Astley, M.A., on "Free Worship: Ancient Rites and Modern Survivals, particularly in the British Isles," 8 p.m.

ROYAL ARCHEOLOGICAL INSTITUTE.—Paper by Dr. Robert Munro. Mr. H. Jones, F.S.A., on "Roman Remains found in Greenwich Park," 4 p.m.

ARCHITECTURAL ASSOCIATION.—Annual Soirée at St. George's Hall, Langham Place, W., at 8 p.m. A musical play will be performed entitled "Arctia: A Legend of the Far North," written by Mr. Gervase Bailey; music composed by Mr. Leonard Butler.

Thursday, June 5.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m. Ballot for the election of Fellows.

ROYAL INSTITUTION.—Mr. M. H. Spielmann on "Contemporary British sculpture."—III., 3 p.m.

Friday, June 6.

ROYAL INSTITUTION.—Sir Benjamin Baker on "The Nile Reservoir and Dams," 9 p.m.

Saturday, June 7.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion to Brancepeth.

Monday, June 9.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Business Meeting; annual elections. 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Special Meeting to discuss the Revised Charges of Architects.

Wednesday, June 11.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.—General Meeting at Burlington House at 3 p.m.

JAPAN SOCIETY.—Annual General Meeting.

INSURANCE.

The Three Schemes of Insurance which we have arranged for the benefit of our subscribers continue to meet with hearty approval, and all readers who have not yet availed themselves of the advantages offered should hasten to do so.

There are three Schemes:—

(1) *A Free Accident Insurance of £500 to every regular reader of our paper.*

(2) *An Accident Insurance of £500, and also £250 for Permanent Total Disablement. £2 10s. per week for Temporary Total Disablement.*

Premium, 1/-

(For the conditions under which policies Nos. 1 and 2 are issued readers should refer to our pamphlet, sent on application.)

(3) *An Accident Insurance of £1,000, with the following special additional advantages:*

£500 for Permanent Total Disablement.

£6 per week for Temporary Total Disablement.

£1 10s. per week for Temporary Partial Disablement.

£30 Annuity.

£3 per week during confinement from such illnesses as Small-Pox, Diabetes, Scarlet Fever, Carbuncle, &c., &c.

Ordinary Risks, Premium, £3/-
Hazardous Risks, Premium, £3/10/-

Write for Proposal Form.

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(3.) It is sufficient for us to have an intimation from the newsagent that he supplies copies regularly.

(4.) Policies can be issued either direct to the subscriber or through the newsagent, whichever may be preferred.

(5.) In applying it is only necessary to write a postcard, giving the full name and address of the newsagent from whom the copy is obtained.

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THE MANAGER, BUILDERS' JOURNAL, EFFINGHAM HOUSE, ARUNDEL ST.,

STRAND

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
June 5	Queenstown, Ireland—100 Artisans' Dwellings	Naval Dwellings Co., Ltd.	W. H. Hill & Son, 28 South Mall, Cork.
" 5	Lambeth, S.E.—Slipper Baths	Borough Council	Borough Engineer, Town Hall, Kennington Green, S.E.
" 5	Prestwich—Temporary Hospital Pavilion	Union Guardians	T. Worthington & Son, 46 Brown Street, Manchester.
" 5	Aberdare—Resiating and Restoration of Church		E. M. B. Vaughan, Architect, Cardiff.
" 5	Exeter—Church		F. J. Commis, 7 Bedford Circus, Exeter.
" 6	Ashington—Church, Classrooms and Vestries		T. Tulip, Whinney Hill, Choppington.
" 6	Ancoats, Manchester—Two Workhouse Pavilions	Workhouse Committee	A. J. Murgatroyd, 23 Strutt Street, Manchester.
" 6	Roths, Scotland—House	A. J. Sharp	W. Sharp, Roths.
" 7	Halesowen, Worcester—Rebuilding Bridge	County Council	A. E. Brooks, Assistant Surveyor, Brendon Cross, King's Norton.
" 7	London, E.C.—Bath and Wash-houses	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Town Hall, Old Street, E.C.
" 7	Westerdale, nr. Castleton—Two Rooms, &c. at Vicarage		T. Stokes, Architect, Thirsk.
" 7	Warwick—Shedding and Yard Fittings, &c.	Agricultural Society	F. H. Moore, Secretary, Northgate Street, Warwick.
" 8	Saunderton—Additions to Infirmary	Wycombe Union Guardians	A. L. Grant, Architect, High Wycombe.
" 9	Ranskill—Additions to "The Grange"		E. H. Ballan, Architect, Oriental Chambers, Doncaster.
" 9	Boughton, Nottingham—Engine and Boiler-houses	Water Committee	W. B. Starr, 12 St. Peter's Gate, Nottingham.
" 9	Barnes—Seven Houses		F. & W. Stocker, 90 and 91 Queen Street, Cheapside, E.C.
" 9	Edmonton—Schools	School Board	H. W. Dobb, 99 Church Street, Lower Edmonton.
" 9	Pentre, Wales—School	Ystradgwydr School Board	J. Rees, Architect, Hillside Cottage, Pentre.
" 9	Llwynpia, Wales—Vestry		Lewis & Morgan, Architects, Dunraven Street, Tonypandy.
" 9	York—Cement, &c.		E. H. Clarke, Stores, Gateshead.
" 9	Whitehaven—Two Houses	North-Eastern Railway Co.	Pickering, Crompton & Son, 11 Lowther Street, Whitehaven.
" 10	Gloucester—Subway under Railway		Engineer, Paddington Station.
" 10	London, S.E.—Shelter for Infectious Diseases	Great Western Railway Co.	W. Jacques, 2 Fen Court, E.C.
" 10	Newcastle-upon-Tyne—Labourers' Dwellings	Camberwell Borough Council	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
" 10	Newcastle-upon-Tyne—Board School	Corporation	H. G. Whyatt, Borough Surveyor, Town Hall Square, Grimsby.
" 10	Birkenhead—Warehouse	School Board	B. Bower, 14 Temple Street, Birmingham.
" 10	West Ham—Repair, &c., of Eighteen Schools	Great-Western Railway Co.	S. Hill, Architect, Green Lane, Redruth.
" 10	West Ham—Mortuary	School Board	H. Ross, 15 Cannon Street, Accrington.
" 10	Grimsby—Alterations, &c. to Police Station	Borough Council	W. Sanderson, 45 Park Road, Aspatria.
" 11	Salford—Schools	Corporation	Rev. L. Busch, Chapelthorpe Vicarage, Wakefield.
" 11	Redruth—Rebuilding, &c. Shop Premises	Corporation	J. P. M'Garth, 28 Carlisle Road, Londonderry.
" 11	Accrington—Workshop, Block, &c.	T. Moore & Co.	F. J. C. May, Borough Engineer, Town Hall, Brighton.
" 11	Aspatria—Cottage	Lang Bridge Ltd.	A. W. Jeffery, 5 Havelock Road, Hastings.
" 12	Chapelthorpe, Wakefield—Church Works		T. Garbutt, Clerk, Board's Office, Manor Row, Bradford.
" 12	Londonderry—Villa		G. Hepworth, 20 Bradford Road, Brighouse.
" 12	Brighton—Pavilion at Sanatorium		W. H. Hill & Son, 28 South Wall, Cork.
" 12	Hastings—Boundary Wall		Convent, West Street, Deal.
" 13	Bradford—School	Parish Council	Borough Surveyor, Devonport.
" 13	Brighouse—Silk Mill, &c.		C. R. Dalgleish, Architect, Central Chambers, Wellington.
" 13	Cork—Residence and Offices		J. T. Kelly, Clerk, Lunatic Asylum, Castlebar.
" 13	Deal—Orphanage at Convent		A. Schofield, 45 Weld Road, Birkdale.
" 14	Devonport—Brick Culverts		H. Dearden, Borough Engineer, Town Hall, Dewsbury.
" 14	Hadley, Salop—Cemetery Chapel Lodge	Urban District Council	R. F. Vallance, Borough Surveyor, Mansfield.
" 14	Castlebar—Extensions to Asylum	Corporation	R. F. Vallance, Borough Surveyor, Mansfield.
" 16	Birkdale—Cemetery Chapel and Lodge	Corporation	Borough Surveyor, Municipal Offices, Liverpool Road, Worthing.
" 16	Dewsbury—Covered Market	Corporation	J. T. Franklin, Architect, Regent Street, Rugby.
" 16	Mansfield—Alterations, &c. to Town Hall	Co-operative Society	J. Moule, Clerk, Brettenham Road, Upper Edmonton.
" 16	Mansfield—Alterations, &c. to Public Baths	Edmonton School Board	Architect's Department, Housing of Working Classes Branch, 19
" 16	Worthing—Brick Chimney Shaft	London County Council	Charing Cross Road, S.W.
" 17	Rugby—Five Shops, Assembly Hall, &c.		O. E. Winter, Borough Engineer, Town Hall, Hampstead, N.W.
" 17	London, N.—Schools		C. H. M. Milchem, Architect, Badshot House, Badshot, Lea.
" 17	London, W.C.—Workmen's Dwellings		T. Tulip, Whinney Hill, Choppington.
" 19	Hampstead, N.W.—Public Conveniences	Borough Council	Giles, Gough & Trollope, 23 Oraven Street, Charing Cross, W.C.
" 19	Badshot Lea, near Aldershot—Church		Architect's Department, 18 Pall Mall East, S.W.
" 20	Broomhill—Store Premises and House	Oo-operative Society	O. J. Dawson, Architect, Bank Buildings, Ilford, Essex.
" 23	Shepherd's Bush, W.—Workhouse and Infirmary	Hammersmith Board of Guardians	
" 23	London, S.W.—Technical Institute	London County Council	
" 23	Ilford—School	School Board	
ENGINEERING:			
June 5	London, S.W.—Pipework	Fulham Board of Guardians	F. H. Medhurst, 13 Victoria Street, S.W.
" 5	Pudsey, Yorks—Concreting, &c., 2 Filters	Corporation	J. Jones, Borough Surveyor, Church Lane, Pudsey.
" 5	Withington, Lancs—Boiler	Chorlton Union Guardians	Manchester Steam Users' Association, 9 Mount Street, Manchester.
" 5	Culkin, Scotland—Landing Ship	Sutherland County Council	D. & C. Stevenson, 84 George Street, Edinburgh.
" 6	Beckenham—Incandescent Lamps	Electric Lighting Committee	R. P. Wilson, 66 Victoria Street, Westminster.
" 6	Dudley—Incandescent Lamps, &c.	Electric Lighting Committee	R. P. Wilson, 66 Victoria Street, Westminster.
" 7	Glasgow—Economiser, Condensing Plant, &c.	Corporation	W. A. Chamen, 75 Waterloo Street, Glasgow.
" 7	Mevagissey—Repairs to Pier		P. Hunkin, Clerk, Mevagissey.
" 7	Forres, Scotland—Waterworks	Town Council	J. Rankine, Water Manager, Forres.
" 7	New Ross—Gasholder	Gas Co., Ltd.	H. Kirkham, Manager, Gasworks, New Ross.
" 7	Settle, Yorks—Waterworks	Rural District Council	T. A. Foxcroft, Council's Surveyor, Town Hall, Settle.
" 7	Worsborough, near Barnsley—Water-mains	Urban District Council	J. Whittaker, Surveyor, Saville House, Worsborough Bridge.
" 9	Tonbridge, Kent—Electric Wiring	Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 9	Kingsbury, Somerset—Waterworks	Langport Rural District Council	Bailey-Denton, Lawford & Symons, Palace Chambers, Westminster.
" 9	Langport—Waterworks	Rural District Council	Bailey-Denton, Son, Lawford & Symons, Palace Chambers, Westminster.
" 10	West Ham—Tramways	Corporation	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
" 10	Brighton—Hot-water Heating Apparatus	Town Council	F. J. C. May, Surveyor, Town Hall, Brighton.
" 10	Lydney—Waterworks	Rural District Council	J. F. Trew, County Chambers, Station Road, Gloucester.
" 10	Port Talbot, Wales—Reconstructing Bridge	Great Western Railway Company	Engineer, Neath Station.
" 11	Calcutta—Sand Washers	Corporation	Engineer, Municipal Office, Calcutta.
" 12	Harrogate—Light Railway	Corporation	E. W. Dixon, 14 Albert Street, Harrogate.
" 14	Abertillery—Reservoir	Urban District Council	T. Rees; Oorn Exchange Chambers, Newport, Mon.
" 14	Boldron, near Barnard Castle—Waterworks	Startford Rural District Council	J. E. Parker, Engineer, Post Office Chambers, Newcastle-on-Tyne.
" 16	Newport, Mon.—Transporter Bridge	Corporation	Borough Engineer, Town Hall, Newport.
" 17	Newton Abbot, Devon—Sluice Valves, &c.	Rural District Council	W. Fox & R. A. Tatton, 5 Victoria Street, Westminster.
" 17	Newton Abbot, Devon—Waterworks	Rural District Council	W. Fox & R. A. Tatton, 5 Victoria Street, Westminster.
" 18	Stretford, Manchester—Electrical Plant	Urban District Council	C. H. Wordingham, 19 Brazenose Street, Manchester.
" 19	New Brighton, Cheshire—Reservoir, &c.	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 24	Bury, Lancs—Tramways	Tramways Committee	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.
" 24	Southall, Middlesex—Alterations, &c. to Sewage Disposal Works	Urban District Council	R. Brown, Engineer, Public Offices, Southall.
" 30	Sydney, N.S.W.—Bridge across Harbour		Under-Secretary for Public Works, Sydney.
July 31	London, S.W.—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.
" 31	Army Contracts—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.
Sept. 15	Launceston, Tasmania—Electric Power Transmission Extensions.	Mayor and Aldermen	J. Terry & Co., 7 Great Winchester Street, E.C.
IRON AND STEEL:			
June 6	London, E.C.—Railway Stores	Bengal-Magpur Rly. Co., Ltd.	Company's Office, 132 Gresham House, Old Broad Street, E.C.
" 9	Copenhagen—Rails and Fastenings	Danish State Railways	Engineer-in-Chief, 11 Colbjørnsensgade, Copenhagen, B.]
" 9	Whyteleafe, Surrey—Cast-iron Pipes, &c.	Qaterham and District Gas Co.	D. H. Anderson, Engineer, Gasworks, Whyteleafe.
" 9	York—Railway Stores	North-Eastern Railway Co.	E. H. Clark, Stores, Gateshead.
" 9	Brighton—Points, Crossings, &c.	Town Council	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.]
" 9	Brighton—Tramrails	Town Council	T. B. Holliday, Tramways Engineer, Lewes Road, Brighton.]
" 10	Tyldesley, Lancs—Cast-iron Pipes, Specials, &c.	Urban District Council	W. H. S. Gendall, Engineer, Gasworks, Tyldesley.
" 10	Tyldesley—Lancs—Cast-iron Pipes, &c.	Urban District Council	W. H. S. Gendall, Engineer, Gasworks, Tyldesley.
" 17	Croydon—Cast-iron Pipes	Lunacy Visiting Committee	Borough Engineer, Town Hall, Croydon.
" 17	Newton Abbot, Devon—Cast-iron Pipes	Rural District Council	W. Fox & R. A. Tatton, 5 Victoria Street, Westminster.
" 24	Bury, Lancs—Rails, &c.	Tramways Committee	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
PAINTING AND PLUMBING:			
June 6	Hounslow—Painting Works	War Office	Royal Engineer Office, 41 Charing Cross, S.W.
" 6	Cricklewood, London—Painting, &c., 103 Houses	Midland Railway Co.	Engineer, Derby Station.
" 9	York—Lead, White and Red Lead, Oils, &c.	North-Eastern Railway Co.	E. H. Clark, Stores, Gateshead.
" 10	Tyldesley, Lancs—Lead Piping	Urban District Council	W. H. S. Gendall, Engineer, Gasworks, Tyldesley.
" 10	Tyldesley, Lancs—Lead Piping &c.	Urban District Council	W. H. S. Gendall, Engineer, Gasworks, Tyldesley.
" 10	West Ham—Painting, &c., Eighteen Schools	School Board	W. Jacques, 2 Fen Court, E.C.
" 11	London, S.E.—Painting at Infirmary	Lambeth Guardians	W. Thurnall, Clerk, Offices, Brook Street, Kennington Road, S.E.
" 11	Northfleet—Painting Council Offices, &c.	Urban District Council	Mr. Honeyman, District Surveyor, Offices, The Hill, Northfleet.
ROADS AND CARTAGE:			
June 5	London, W.—Granite Spalls	Kensington Guardians	J. H. Rutherglen, Guardians' Offices, Marloes Road, Kensington.
" 5	London, S.W.—Vans for Fire Escapes	London County Council	Clerk, County Hall, Spring Gardens, S.W.
" 5	Chatham—Materials	Corporation	O. Day, Borough Surveyor, Town Hall, Chatham.
" 6	Chichester—Street Works	Corporation	City Surveyor, Chichester.
" 7	Burnley—Widening Lane	Rural District Council	S. Edmondson, 18 Nicholas Street, Burnley.
" 9	York—Flags, Stone, Slag, &c.	North-Eastern Railway Company	E. H. Clark, Stores, Gateshead.
" 9	Ely—Materials	Council	W. McKelvie, City Surveyor's Office, Ely.
" 9	Liversedge, Yorks—Lane Improvement Works	Urban District Council	A. E. Rhodes, Architect, Cemetery Road, Heckmondwike.
" 10	West Ham—Making-up Streets	Town Council	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
" 10	Southall, Middlesex—Making-up Road	Urban District Council	R. Brown, Surveyor, Public Offices, Southall.
" 10	West Ham—Paving Roads on Tramway Routes	Town Council	J. G. Morley, Borough Engineer, Town Hall, West Ham.
" 11	Greenwich—York Stone	Borough Council	Borough Surveyor, Town Hall, Greenwich Road, S.E.
" 11	Northfleet, Kent—Road Materials	Urban District Council	Mr. Honeycombe, Surveyor, Court House, Gravesend.
" 11	Kingston-on-Thames—Granite and Flints	Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames.
" 12	Uxbridge—Roadworks	Rural District Council	J. F. Stow, Surveyor, Oorn Exchange, Uxbridge.
" 14	Uckfield, Sussex—Hire of Road Rollers	Rural District Council	F. Holman, Clerk, High Street, Lewes.
SANITARY:			
June 5	Blaydon-on-Tyne—Scavenging	Urban District Council	R. Biggins Sanitary Inspector, Blaydon-on-Tyne.
" 9	York—Lime, Drain Pipes, &c.	North-Eastern Railway Co.	E. H. Clark, Stores, Gateshead.
" 9	Bridgwater, Somerset—Sewer	Town Council	Borough Surveyor, Municipal Buildings, Bridgwater.
" 10	London, E.C.—Sewer	Finsbury Borough Council	Borough Surveyor, Town Hall, Rosebery Avenue, E.C.
" 11	Walsall—Lime	Corporation	J. R. Cooper, Town Clerk, Borough Offices, Walsall.
" 17	Hamilton, Scotland—Drainage Works	District Committee	W. L. Douglas, District Engineer, District Offices, Hamilton.
" 18	Dartford—Drain	Urban District Council	W. Harston, Surveyor, Sessions House, Dartford.
" 21	Pontefract—Sewage Works	Town Council	B. Latham, Parliament Mansions, Victoria Street, Westminster.
July 7	South Stoneham—Sewerage Works	Rural District Council	Bailey-Denton, Son, Lawford & Symons, Palace Chmbs., Westminster.
TIMBER:			
June 6	Cardiff—Pitwood	Nixon's Navigation Co., Ltd.	J. L. Herbert, Secretary, Bute Docks, Cardiff.
" 9	South Helton—Timber	Coal Co., Ltd.	J. R. Lambert, South Hetton, Sunderland.
" 9	London, W.C.—Firewood	London School Board	Contracts Sub-Depart., School Bd. Offices, Victoria Embankmt., W.C.
" 9	Blackpool—Timber	Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June 12	Crewe—Municipal Office and Council-Chamber	£50, £25.	Borough Surveyor, Municipal Offices, Crewe.
" 16	Hartshill, Stoke-on-Trent Nurses Home	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 17	Clonmel—Ten Labourers' and Two Artizans' Dwellings	—	J. F. O'Brien, Town Clerk, Corporation Offices, Clonmel.
" 22	Rhymney—Cottage Hospital	—	B. Jones, 29 Plantation Street, Rhymney.
" 27	West Hartlepool—School	£75, £35.	J. R. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.C. Offices, Tottenham.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.

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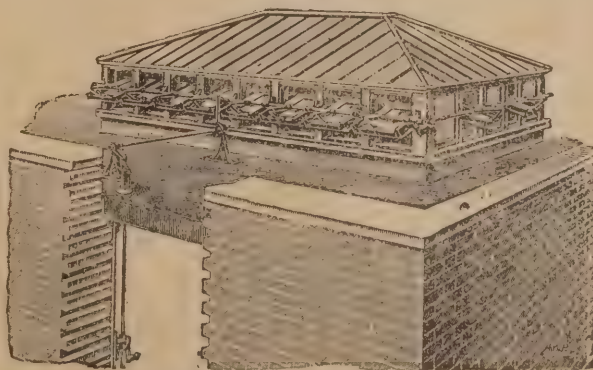
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which is open till the end of July at the Princes' Skating Club, Knightsbridge, S.W. When the intention to hold such an exhibition was announced some months ago we anticipated a collection of those monstrosities which the Secessionists have made peculiarly their own: so that it was with pleasant surprise we observed an entire absence of what we had expected: and in this we can ourselves take some credit, as our remarks proved fruitful in the authoritative quarter. The decoration of the rooms in which the exhibits are arranged is exceedingly tasteful and effective. There is no suggestion of the ordinary stock-in-trade of the exhibition decorator, with his banners and flags and drapery arranged in garish confusion: in place we find the walls covered with soft-toned hangings, relieved with a decorative dado and sundry well-chosen devices, the floor pleasingly carpeted, and the top light diffused through white material relieved with bands of tape and the royal arms of Austria. Along the side walls of the rooms are arranged the furniture exhibits, these taking the form of completely furnished rooms themselves, while the rest of the space is occupied by cases and stands of metal, china, lace and other work. These smaller exhibits are far inferior to the furniture, and among them are many examples of that unrestrained aspect of the New Art which are happily not to be seen in the furnished rooms: and it is to the latter that we wish now to refer. Many of the rooms are quite unlike anything exhibited here before, for the work, though it possesses some of its characteristics, is most noticeably different in detail from what the Arts and Crafts ideal has produced. The finish of the woodwork is at once seen to be remarkable. The surface is wonderfully smooth and highly polished; pear and cherry are the favourite woods used, left untouched in some cases and stained in others, the top surface of the wood being removed after staining and prior to polishing. The design of the furniture itself follows new motifs entirely, but, in general, the material has been carefully respected, the wood being used straightly and squarely and not cut in swirling shapes and foolish curves. This is especially noticeable in the dining-rooms designed by J. Niedermoser and A. Fix. The former is panelled in cherry-wood to a height of about 5ft., the whole being squarely treated and

finished with a row of small brown tiles framed in. The sideboard is carried out after the same manner, and has the curious feature of a glass-fitted top, the glass being let flush into a recess, which is covered with chamois leather. Ingenuity of this kind is frequent throughout the exhibition, down to the smallest articles; for instance, some cups and saucers are shown with the cup fitted at one side, the centre of a decorative pattern which extends over the rest of the saucer—this amuses one at first, but attracts and satisfies when the object of such a change is known. The room by A. Fix is very handsome, the wood used being Australian ebony, a rich red wood that takes a wonderful polish. These two rooms are perhaps the most attractive in the exhibition, but there are several others of considerable merit, such as the smoking-room in Austrian oak by W. Höller. At the end of the range of rooms is the refreshment-room, special mention of which should be made on account of the artistic manner in which it has been decorated. It is a round apartment, and the walls above the dado line have panoramic views of Trieste, Vienna, Innsbruck and other Austrian

Curves and Kinks. THE use of the curve in building is one of those details which the average man will never know anything about, yet what a part it has played in the best architecture for centuries! The most familiar instance of its use is in the Parthenon at Athens. The spectator sees a temple of straight lines before him, but careful investigation and measurement have proved the existence of subtle curves introduced to soften and mitigate the harshness of absolutely straight outlines. The idea, once established, passed into a recognised practice, and lasted down to the nineteenth century, when it very suddenly declined and—in popular architecture—can scarcely be said to exist any longer. The result is disastrous in the extreme. Many a building owes comparative failure and harshness of outline to this single cause. The other uses of the curve are too numerous to mention; it appears in endless variety in Gothic arches and vaulting, and is always graceful and effective. It should be said that in the time of the Greeks the curves were true mathematical ones, and are generally so in the best examples of later times, a remarkable



MR. ALFRED HARMSWORTH'S PRIVATE ROOM AT THE "DAILY MAIL" OFFICE.
ARTHUR C. BLOMFIELD, F.R.I.B.A., ARCHITECT.

towns, separated from one another by pylons, each crowned by a female head red-bronzed. Garlands of leaves covering electric lights hang lightly between the pylons, while overhead the apartment is ceiled with a light muslin velarium pierced with holes of various sizes, by which a delightful quality of light is secured. The bandstand at one end is cunningly arranged, and in the centre of the room stands a statue of the Austrian Emperor. The exhibits must be seen to be appreciated. Some of them are not praiseworthy—many of the chairs might certainly be improved—but on the whole the visitor comes away with a feeling of pleasure; he is glad to see that the work, though so modern, is so good, and he is glad to learn also that Austrian designers are not all of that one body of "Secessionists" hot in the pursuit of novelty and mad in its adaptation to everyday requirements. It is perhaps well to say in conclusion that the exhibition has been carried out under the patronage of the royal house and ministry of Austria, and that among the members of the honorary London committee are such well-known architects as Mr. Ernest Newton, Mr. Aston Webb, Mr. William Emerson, Mr. R. A. Briggs, Mr. E. L. Lutyens, Mr. Huntly-Gordon, Mr. Romaine-Walker and Mr. Fellowes Prynne.

testimony to the intimate correlation of use and beauty. But a curve is one thing and a kink is another; the latter is the accidental backward and outward twist of a rope which sometimes occurs and prevents it from running smoothly over a pulley. It has no beauty or fitness of any kind, and is simply a fault. For this reason probably it has been seized upon by the decadents of the Art Nouveau school, and after displaying itself in wildest profusion upon the monstrosity called the Castel Béranger in Paris, has begun to spread in England, and appears with alarming frequency in London. It is seen in leaded and other lights of windows and in glass doors, bristles in restaurants amidst a plethora of "styles" of decoration, and it literally runs riot in the newest furniture. It has nothing to recommend it save novelty, but it cannot be dismissed as a freak, for it is evidently becoming fashionable. It is one more evidence of the perfect ignorance of the public upon architecture and decoration—decoration which to be effective must always follow architectural lines—and it is part of that general revolt against fitness and congruity which in Germany has slanted the tops of windows and made doors to appear as if off their hinges.

THE TURIN EXHIBITION.

By E. M. STEVENS.

FOR the third time during eighteen years buildings of varied form and size have invaded the precincts of the lovely public park that surrounds the castle of the Valentino, one of the finest architectural works in Turin, erected about 1650. Ever since the impulse of a new decorative art arose in England, an increasing need has been felt in Italy for a fresh direction being given to decorative work in buildings, as well as in furniture, manufactures, &c. In January, 1901, a meeting of citizens was held to consult on the practical carrying out of this idea, and a committee was formed, chosen from the most eminent engineers and artists in Turin. A competition was afterwards announced. Milan and Venice had each intended to hold an exhibition in 1902, but both not only generously gave place to Turin but promised their hearty support in every way to obtain a general, original manifestation of the fresh and youthful talent of the whole peninsula. The designs, which were to cover an area of 10,000 square metres, had to be arranged so as to interfere as little as possible with the views in the park, and to preserve intact the clumps of trees. Eleven competitors appeared. The first prize was awarded to the architect D'Aronco and the second to Professor Rigotti: in addition, four other projects were honourably mentioned. In 1893 D'Aronco was called to Constantinople to arrange an exhibition of Industry and Agriculture—an idea afterwards abandoned—but he has remained there ever since as architect to the Sultan.

In eighteen days he designed and sent sixteen large drawings to Turin. In April he arrived, and in less than twenty days offered a corrected plan which obtained the unanimous approval of the committee.

The principal building includes the previously existing Fine Arts Gallery, in which the quadrennial exhibition of pictures is to be held. It is devoted to decorative art. This edifice, to the east of the fine arts section, consists of a central part having a rectangular saloon, on each side of which are smaller halls, a terrace being

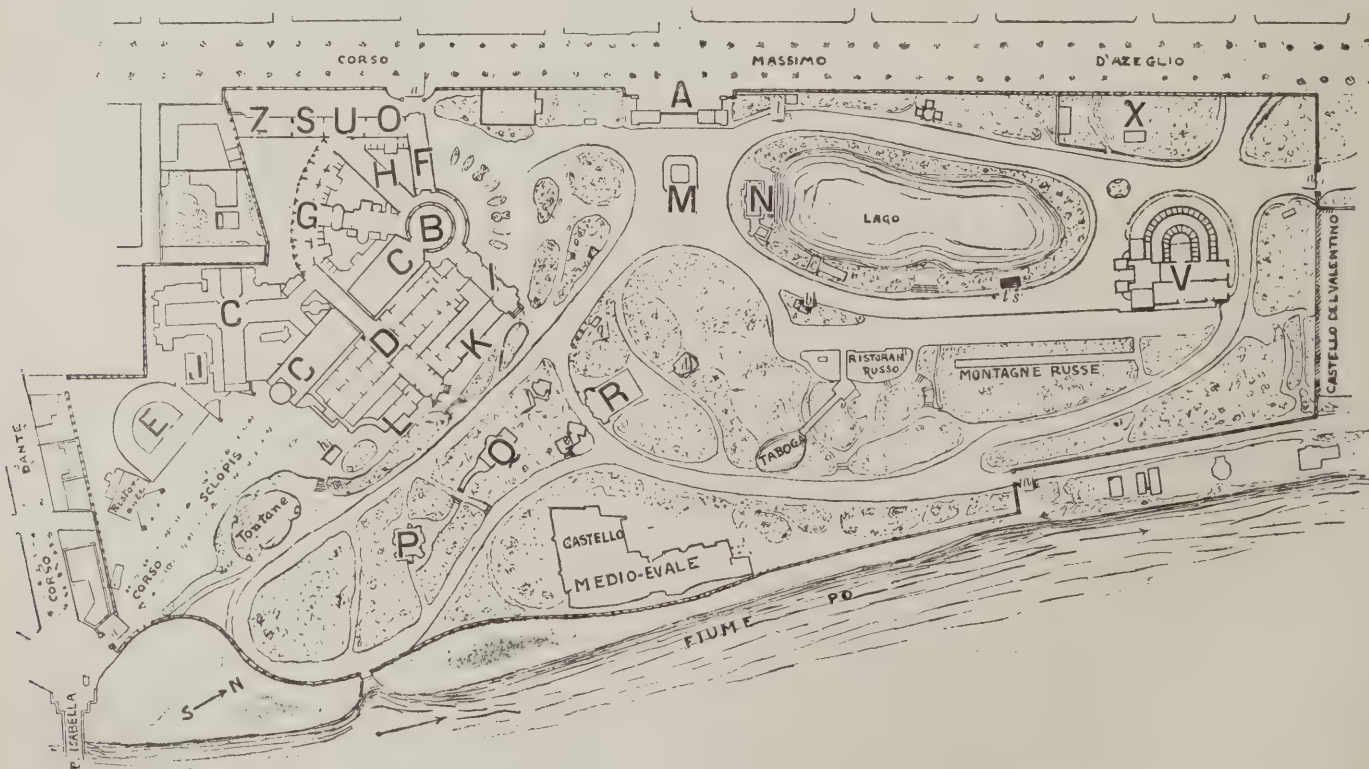


MAIN ENTRANCE: STATUE OF THE LATE DUKE OF AOSTA IN THE CENTRE.

arranged over the first-named rooms. To the left a gallery 8 metres 65c. wide, and to the right another 13 metres wide, are carried on to the next building.

The Rotunda is the principal entrance to the exhibition. Its internal diameter is 29 metres, covered by a semicircular ceiling; around the wall are ten pilasters, surrounded by a circular gallery, from which others lead. The vestibule is reached by three rounded flights of steps. Ten large semicircular openings are arranged around the wall, three of which serve as entrances to the galleries. The gallery on the right of the Rotunda is exactly similar to that on the left, except that, by reason of its being on a higher level, eight steps must be ascended. On the

north west a perimetral gallery gives access to rectangular spaces for furnished saloons or completed rooms. The external façade of this gallery is decorated in the same style as the two galleries of the chief façade. Besides three other galleries, there is a building consisting of a main gallery 117 metres long and 26 metres wide, divided by a row of isolated pedestals, flanked by a lower corridor with a series of rooms decorated and furnished; one part is used as a café, down to which a staircase leads from the main gallery. The front to the south is intended to hide the façade of the older building and has a door corresponding to the entrance to the same. The external decoration of the south face as well as the north consists of



GENERAL PLAN OF THE EXHIBITION.

A, chief entrance, with post- and telegraph-offices. B, rotunda. C, gallery of Italy. D, Gallery of Fine Arts. E, pavilion of motor-cars. F, gallery of France. G, gallery of Germany. H, gallery of the United States. I, gallery of Great Britain. J, pavilion Jesurum (Venetian lace). M, monument of the late Duke of Aosta. N, committee-room, press. O, gallery of Holland. P and Q, pavilions of Austria. R, pavilion of photography. S, gallery of Switzerland. U, gallery of Hungary. V, exhibition of wines, oils, &c. X, Sudanese village. Z, gallery of Japan. a, a, a, secondary entrances. b, pavilion for liquors, &c. c, cinematographe. d and e, restaurants. g and h, pavilions of gas and tobacco respectively. q, aquarium.

statues placed against the walls, human and animal heads, great masks at the corners, ribbons and flowers coloured and richly gilt. All round the edifice on the top of each pilaster are globes of large diameter, supported by colossal brackets of iron, enclosing electric lights.

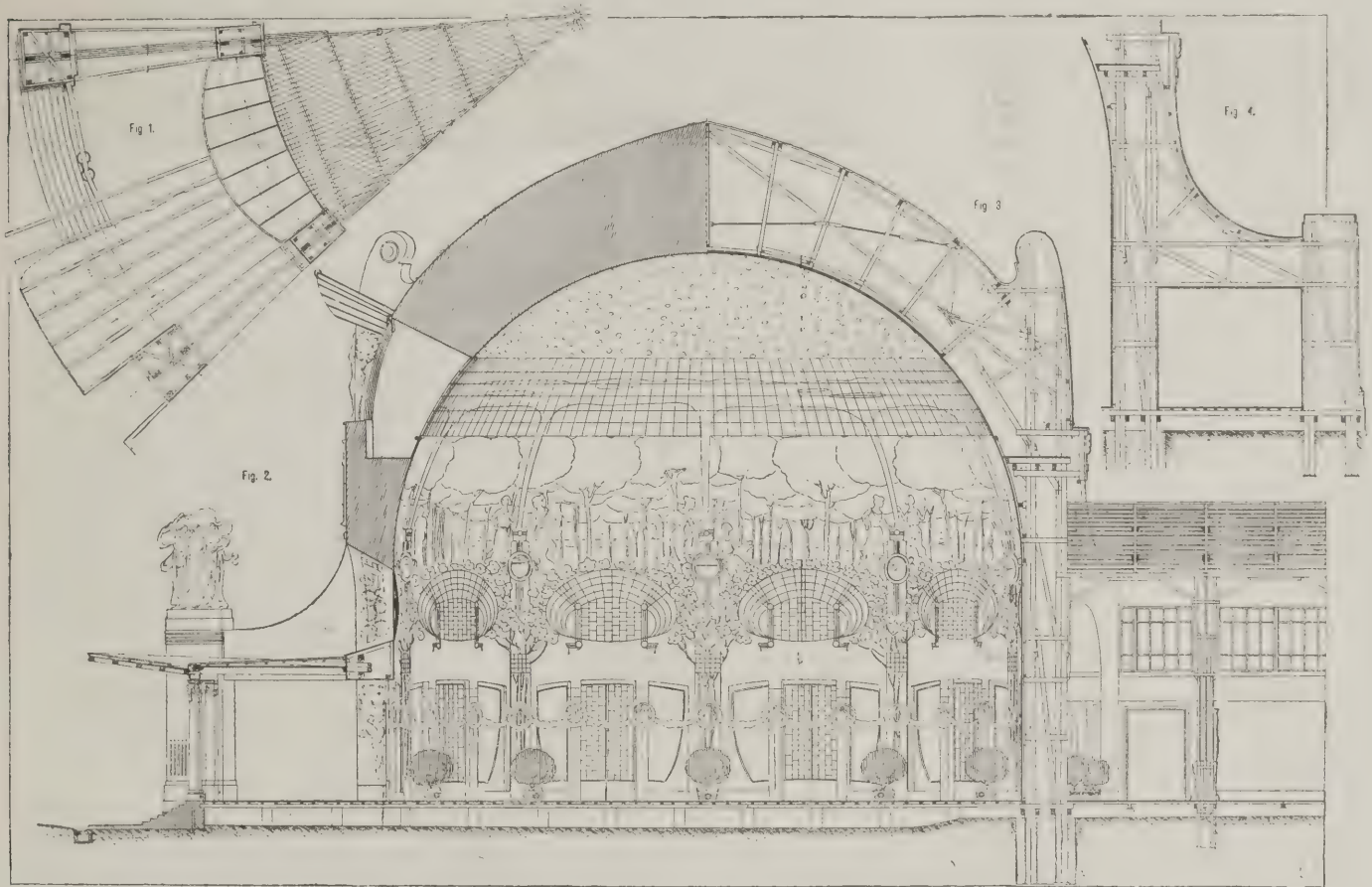
In that part of the park near the castle is a low building with purple panels, intended for the exhibition of wines and oils; it extends the whole length of the walk called "the avenue of sighs." To the left, towards the river, runs the switchback, or Montagne Russe, and the Taboga. The Ristorante Russo is permanent. Then the several buildings where John Getz has prepared the exhibits of the United States, Paul Horti those of Hungary, Victor Horta for Belgium, Cav. Van Loon, Holland, Baumann, the counsellor architect, Austria (his art astonished the visitors to Paris in 1900)—his colleague, Arthur von Scala, director of the Royal and Imperial Museum and the art school connected with it, presides over innumerable exhibits.

MR. SPIELMANN ON MODERN BRITISH SCULPTORS.

The Concluding Lecture.

THE third and final lecture of the series on "British Contemporary Sculpture" was delivered by Mr. M. H. Spielmann at the Royal Institution on Thursday last. Speaking of the proposal to create a Ministry of Fine Arts, he said, "Assuredly a pretty sure way to secure bad sculpture is to establish a Fine Arts Minister from among our distinguished politicians," and went on to show the treatment publicly accorded by statesmen of Cabinet rank to Mr. Norman Shaw's "New Scotland Yard," one of the finest modern buildings in England. Mr. Spielmann admitted that a Fine Arts Department might do much to foster sculpture if, as is done in France and elsewhere, good statuary were commissioned for our parks and squares. The enlightenment

Mr. Goscombe John, A.R.A.; "Parting," the admirable and austere "St. John the Baptist," "The Elf," the remarkable effigy of the late Duke of Devonshire (which enjoyed the unique distinction of having gained a gold medal at the Salon), and the new memorial to Sir Arthur Sullivan were successively shown and discussed. Several important works of the rising Australian-born sculptor, Mr. MacKinnell, were accorded attention, together with the work of the essentially decorative sculptors Mr. Schenck and Mr. Hampton. These were followed by some of the chief productions of Mr. Fehr—the "Hypnos," "Perseus and Andromeda," and others. Mr. Spielmann replied to a charge that he had treated the British School of sculptors with too much indulgence, and he referred to the younger men, whose work he was showing, as those among whom we were now to look for the Gilberts, Brooks and Thornycrofts of the future—the men, too, who were building up a British sculptural tradition, but who, it was hoped,



THE ROTUNDA. FIG. 1, PLAN OF ONE OF THE TEN DIVISIONS OF THE DOME. FIG. 2, TRANSVERSE SECTION. FIG. 3, DETAIL OF FRAMEWORK. FIG. 4, ONE OF THE BUTTRESSES.

Carlo Spindler is responsible for Alsace-Lorraine; Bobberg and Max Sachs for Sweden; Olbrich for Darmstadt; Walter Crane for England; Newbery and Rennie for Scotland. Not far from the mediæval castle is a restaurant capable of accommodating 500 persons. In a green nook stands the Sudanese village. The photographic exhibition is effective too, and the luminous fountains, so popular in 1898, are again put in action. What with fêtes of all kinds, concerts, music competitions, races, horse-show, steeple-chases (these latter attended by military men of most nations), regattas, illuminations (always so artistically and gracefully arranged at Turin), fireworks, &c., there is plenty to interest and amuse the numerous visitors till November.

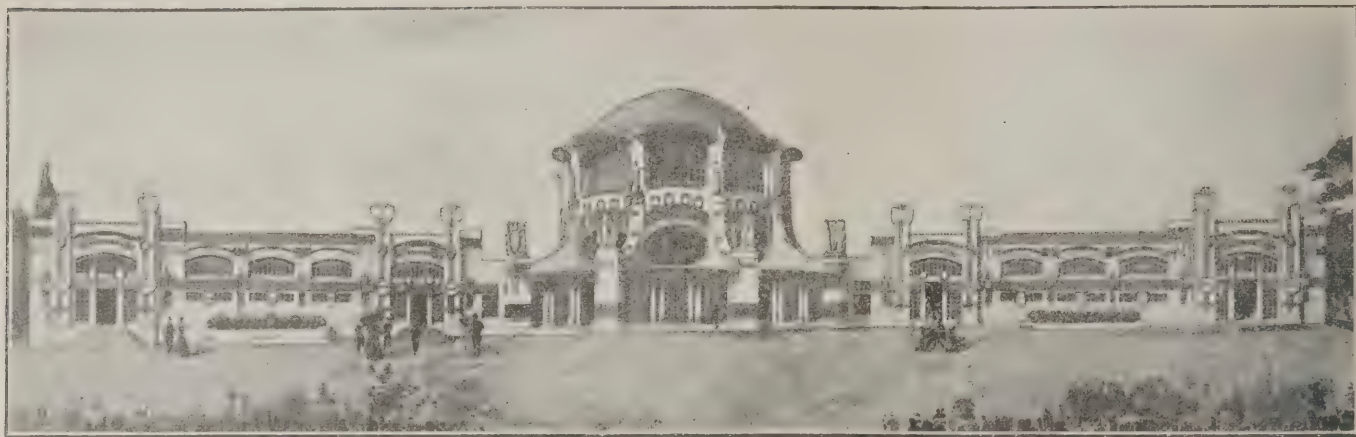
[The writer begs to acknowledge the aid received from the new publications of the firm of N. Bertolero on Decorative Art, and the kindness of Eng. Corradini, editor of the "Ingegneria Sanitaria."]

A New Church Hall at New Basford, Nottingham, is being erected in connection with St. Augustine's Church, on a site in Sandon Street. Mr. A. R. Calvert is the architect.

shown by many commercial houses, from Lloyd's Registry to the owners of shop fronts, in the employment of excellent sculpture for the decoration of places of business was referred to as an exhilarating sign; and then followed a lively diatribe on what was called "the bane of committees." To the ignorance and the interference of these committees (the members of which are rarely, if ever, appointed in virtue of the only qualification which could justify their selection—the expert knowledge and appreciation of sculpture) were attributed many of the failures for which certain of even our best sculptors are responsible; for the frequent practice of committees is to "choose a poor sculptor and bully him, or a good one and provoke him." The plea was made on behalf of sculptors generally that committees should always act through and with the advice of an expert, just as in the case of architecture an assessor is employed.

The work of Mr. Pomeroy and Mr. Albert Toft was spoken of and illustrated, followed by an interesting series of the chief works of Professor Lanteri, of the Royal College of Art. The work of Mr. Birnie Rhind, of the Royal Scottish Academy, came next, and then that of

would not be carried away by the present passion for ornament, but would turn their eyes to what is more truly sculptural. The work of Mr. Rollins, Mr. George Wade, Mr. Bayes and Mr. Colton was then shown. Mr. Colton was spoken of as one of the most able leaders of the younger men. Mr. Taubman, Mr. Pittendrigh Macgillivray, Mr. Paul Montford, Mr. Wheatley, Mr. Tweed (the sculptor of the statue of Cecil Rhodes), Mr. Derwent Wood, Mr. Turner, Mr. Shannan, Her Royal Highness the Princess Louise, Duchess of Argyll, Miss Giles and Miss Levick were dealt with in order, and characteristic sculptures of each were displayed. Then the decorator-sculptors were taken in turn—Mr. Walter Crane, Mr. Anning Bell and Mr. Lynn Jenkins; and then the painter-sculptors—such as the late George Richmond, R.A. But none, declared Mr. Spielmann, surpasses in power Mr. G. F. Watts, R.A., to whose work he applied enthusiastic praise. The magnificent recumbent effigy is excelled in modern times by no work of its class. "Hugh Lupus," now at Eaton Hall, was shown, then "Physical Energy," and the recently-completed "Clytie." Mr. Spielmann took the achievement of "this grand old man, who in his eighty-sixth year has



TURIN EXHIBITION : MAIN FRONT.

been working on one of the masterpieces of his life," as marking a standard for the younger men; and returned to the point that here was seen true sculpture as apart from ornament and decoration.

STATE ARBITRATION.

The Working of the New Zealand Labour Law.

THE following remarks on the above subject have been sent to us by the Liberty and Property Defence League (7, Victoria Street, Westminster, S.W.) :—

The success of the New Zealand law, which compels employers and employed to submit their disputes to a State Arbitration Court and abide by its decisions, is too readily taken for granted in this country. Mr. Pember Reeves, the author of the Act and Agent-General for the Colony, never loses an opportunity, by letters to the "Times" and lectures, of strengthening the impression that the Act is an unqualified success. His official position secures a favourable reception for his utterances, for people are apt to suppose that an official personage must of necessity be impartial and hold himself aloof from controversy. Even officials, however, have their private views and interests. It should not be overlooked that Mr. Reeves is a convinced socialist, and as such a believer in State regulation of industry, and also that, as author of the Arbitration Act, he is, not unnaturally, prepossessed in favour of his legislative bantling.

Those who keep themselves *au courant* with New Zealand affairs, by studying its press and otherwise, know that the Act does not work as smoothly as is pretended. They know not only that the employing class is dissatisfied and uneasy, but that the employed also, outside the circle of professional agitators whose interest it is to create disputes and thus to earn the fees provided, are by no means

convinced that existing arrangements favour their interests. The other Australasian Governments hesitate to commit themselves to the principle of compulsion. They are much nearer to New Zealand than we are, and presumably have better facilities for information. Thus the

and a report of its final sitting at Auckland for the purpose of hearing evidence was published in the "New Zealand Herald" for April 22nd last.

From the evidence of witnesses it appears that the employing class is unanimous in con-

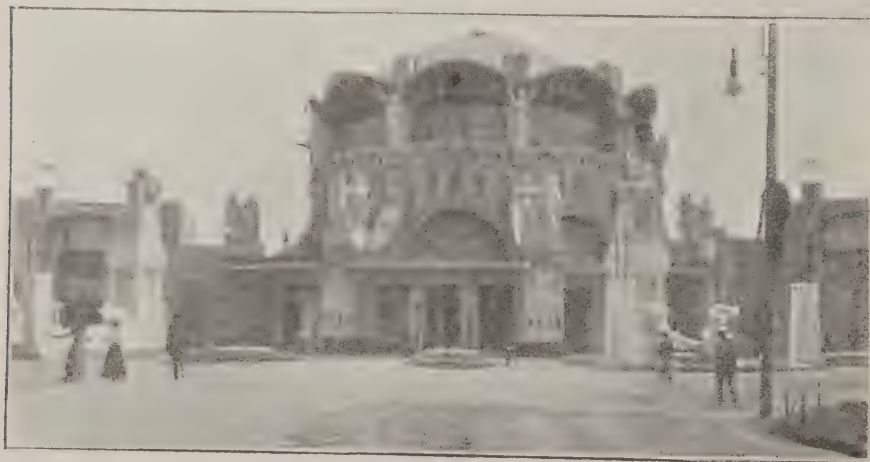


PAVILION OF PHOTOGRAPHY.

Victorian Parliament has thought it advisable to send a Labour Commission to New Zealand to make enquiry before adopting any amendment in the Victorian Shops and Factories Act, which expires this year. This Commission has visited the various industrial centres of New Zealand,

denying compulsory arbitration and State regulation of hours of labour and wages, while the employed classes, though approving the system as a whole, are clamorous for amendments, generally in the direction of greater stringency. It was said, for instance, by the spokesmen of the Unions that men who had appeared before the Arbitration Courts and given evidence hostile to their masters have become marked men and lost their situations, and that, therefore, it was essential that labour interests should be represented by outsiders. The representation of labour views seems under this Act to have become a sort of profession or vested interest. This is so even more in New Zealand than in this country. It is difficult to judge to what extent those agitators really represent the views of the average labouring man. The latter has not the ability to state publicly the case for his class, and even if he had, the fear of offending his employer, or still more, of offending the organisers and leading spirits of his union if he took the side of his employer, would deter him. So it seems inevitable that under an Act like the New Zealand one, which tends to set up and accentuate rival interests, the case for the wage-earner must be confided to men who are not dependent upon wages, but who, on the contrary, are interested in provoking disputes.

Two or three governing facts must be remembered concerning the present position of New Zealand. That there is and has been consider-



THE ROTUNDA.

able prosperity is undeniable. The South African War has benefited the colony, both by causing a great demand for its produce and by removing for a time the number of its unemployed. The Colony has for years past been living on loans. Its debt is the highest per head in the world—in round figures £40,000,000 for a population not exceeding that of Glasgow, and a population which, owing to a phenomenal fall in the birth-rate and to the cessation of immigration, is almost stationary. These governing conditions must be borne in mind. It would be rash to conclude because New Zealand is prosperous owing to or in spite of stringent labour legislation that methods can be applied to a country like England (whose industries are subjected to fierce foreign competition) similar to those adopted in New Zealand, which is almost a self-contained community and far removed from the high road of the world's commerce.

The evidence of the employers is, as has been already stated, unfavourable to the Act. That, as a labour man would say, goes without saying. Still, employers may not be always mistaken or interested in their views. They know that their interests are bound up with those of the Colony. They say, as per evidence reported, that for quite three-quarters of the New Zealand people the cost of living has been largely increased by the Act. This may or may not be an exaggeration. They say that it has produced an almost endless number of disputes affecting every kind of industry, and that there have been at least ten times as many disputes as there would have been strikes in the same time without the Act. They say it has brought into existence a whole army of professional agitators, who incessantly make strife and create trouble between masters and men. They say that the Arbitration Court has gradually, at the constant instigation and demands of unions, changed its functions of pure and ample arbitration till now it virtually regulates all industries down to the very smallest details. They conclude that a period of depression will put the Colony to such a strain that the instinct of self-preservation will compel it to call for aid upon those capitalists and employers who are flouted and harassed in a time of prosperity due to exceptional causes. An Act which has called forth such bitter criticism from one of the two interests affected by it, and which is said by the other to be in urgent need of amendment, can hardly be considered successful. Most people in this country will, when they know these facts, be inclined to wait to see how things go in New Zealand before considering the possibility of applying State compulsion method to labour disputes.



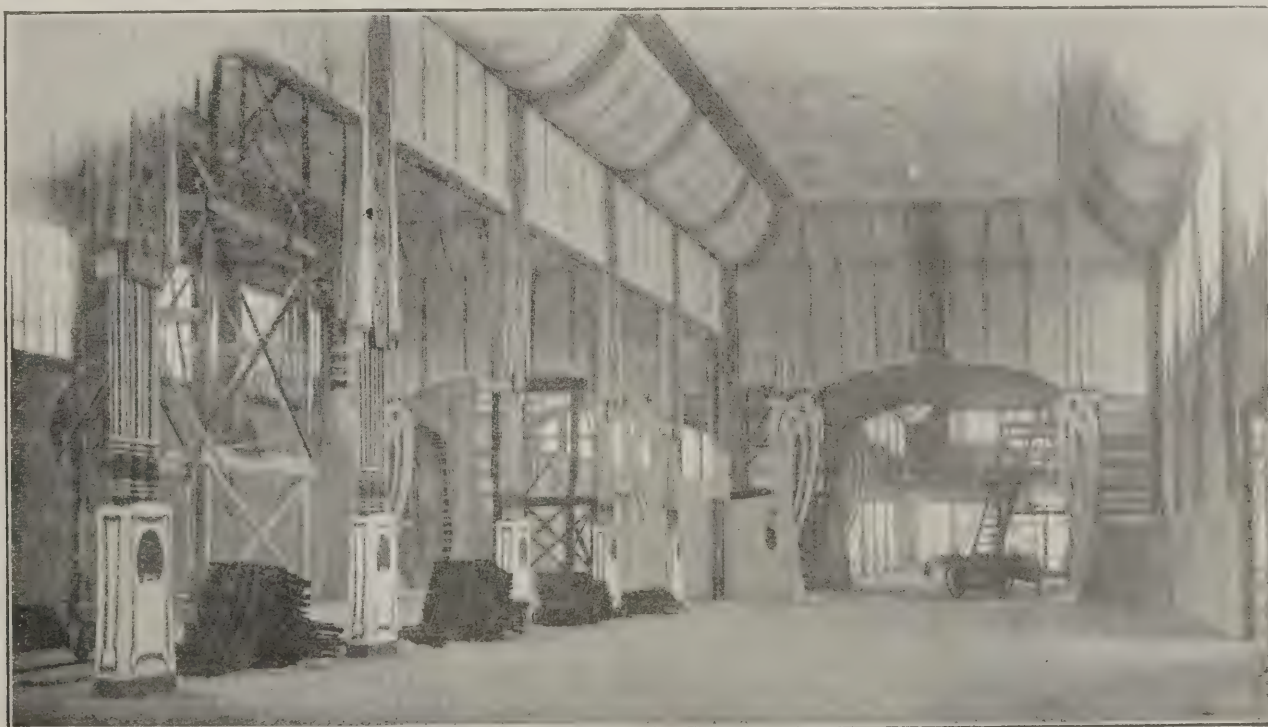
PAVILION OF AUSTRIA.

LEIGH INFIRMARY COMPETITION.

THE Committee of the Leigh Infirmary recently invited competitive designs for an infirmary, and in response they received more than fifty sets of designs, which have lately been publicly exhibited. The conditions required an infirmary for sixty beds, only thirty of which are to be erected at present, and those to be so arranged that the additional thirty may be added at any future time without disturbing the first portion. It was suggested that the wards for males and females should be equally divided; that the infirmary would be under the charge of a matron, but that accommodation for a resident medical officer should be provided. A complete out-patients' department was required, consisting of waiting-room, two consulting rooms, casualty room and dispensary. A detached mortuary and post-mortem room were to be provided, also an operation room, a laundry and accommodation for a resident porter. Beyond this competitors were left entirely free as to the accommodation to be provided. The cost including fittings was fixed at £15,000 for the sixty beds. Mr. Alex. Graham, F.R.I.B.A., was appointed assessor.

The design placed first is by Mr. J. C. Prestwich,

scheme No. 2. The administrative block is placed parallel with and facing the western boundary of the site, and occupying a central position, with the out-patients' department to the right (south) and the kitchen department to the left (north), both these blocks being partially disconnected from the centre block by corridors ventilated on one side. The main corridor leading to the wards runs due east and leaves the administrative block at a point between the centre and kitchen blocks. Two pavilions only are provided for the total of sixty beds, each two stories high and branching off from the main corridor at right angles towards the south and parallel with the administrative block; all are placed about 67 feet apart. About midway between the front block and the first pavilion are placed the operation-room block on the north side of the main corridor, and the ward staircase on the south, and between the first and second (future) pavilions are placed the future ward staircase and conservatory. The laundry block occupies a position on the boundary, and north of the first pavilion, while the mortuary is placed at the north end of the second pavilion but is set back a few feet from the north boundary.



GALLERY OF ITALY.



ITALIAN HOUSE AND RESTAURANT.

The entrance for goods, coals and mortuary is approached from the road along the north boundary of the site. The internal arrangements of some of the blocks appear to be very unsatisfactory, the out-patients' department in particular. Only two consulting-rooms are provided, and these are so arranged that they must be lighted entirely from the top. No stripping rooms are provided, and the position of the men's water-closets, which necessitates them leaving by the entrance and walking round the side of the building, is one likely to cause confusion. There is no access to the out-patients' waiting-hall other than through the consulting-rooms, a defect which will lead to much inconvenience and annoyance to the doctors. Adjoining the waiting-hall is an apartment marked "Bicycles," and one wonders if this is to be taken seriously or whether it is a little mild sarcasm on the part of the architect as to the class of out-patients treated. The central portion of the administrative block is, on the whole, well planned, though the main staircase appears unnecessarily large, if indeed at all necessary, seeing that the board-room is on the ground floor and the upper floors are occupied entirely by nurses' and servants' rooms; so that the space might with advantage be devoted to the nurses' bedrooms, which are rather too small. Too much space is taken up by box-rooms on the attic floor, to the detriment of the servants' accommodation, and the special staircase leading from the first floor to the nurses' box-room is quite unnecessary for so small an

institution; in any case, having six windows, it would be very unsuitable for the purpose. A cook's bedroom 21ft. by 16ft. is provided, though four of the five servants are housed in cubicles. The kitchen department is well arranged in itself, with all cooking appliances are shown in detail, the outside cross-ventilated larder being a special feature worthy of note. The ward pavilions are hardly so satisfactory in arrangement. Each is identical in plan and every floor is similar, there being one large ward 26ft. by 49ft. for twelve beds with sanitary towers at the angles, enclosing a balcony in the usual manner, while between the large ward and the main corridor are two private wards for one or two beds respectively, neither of which is cross-ventilated. On the other side of the passage, which is badly lighted, are placed the ward scullery (only overlooking the large ward), patients' clothes-store, linen store, and lavatory and water-closet not disconnected from the pavilions. On the north side of the main corridor, and lying axially with the pavilion, is placed the future day-room, overlooking the laundry and mortuary, added to which it has a north exposure, so that its aspect is hardly cheerful for patients. The exterior may be described as the Lancashire phase of the English Renaissance freely treated—exceedingly free. The estimated total cost of this design, calculated at 8d. per cubic ft., is £15,893 for the completed scheme of sixty beds—£893 above the limit.

The design placed second is by Messrs.

A. W. Pye and R. F. Bacon, of London, and is very similar to that placed first, the sixty beds being provided in two pavilions of two storeys each; but the design generally is inferior, though the position of sanitary offices at the entrance end of the wards is preferable, being equally convenient for large and private wards. On each floor of the pavilions there is one large ward 26ft. wide for thirteen beds, and two private wards for one and two beds respectively. Only one ward-staircase is provided, and as this is placed between the pavilions those going to the first-floor ward of the first pavilion would need to retrace their steps. The out-patients' department is the old type of plan, patients having to re-enter the waiting-hall after consultation. The administrative department is unnecessarily large, and no doubt this has contributed to the design being placed second. Porter's and engineer's bedrooms are provided on the ground floor, and beyond these are placed the nurses' day-room and matron's office, and though a westerly aspect was available for the resident medical-officer's rooms, these are placed to the east or back of the building. Fourteen bedrooms for nurses are provided, and two bathrooms are considered necessary for eight servants. The elevations are treated in a dignified manner, if perhaps a little too severe for this class of building.

The design placed third is by Messrs. Bultery & Bird of Morley, and is an entirely different arrangement to either of the others, all the wards being placed on the ground floor in two pavilions and parallel with each other and the east and west boundaries. Centrally between them is placed the administrative block facing south, while to the right of this is the kitchen department, and to the left the operation-room block with north light; between these and centrally behind the administrative block is the out-patients' department, some distance back and entirely disconnected, approached from the road along the north boundary. The laundry and mortuary occupy positions between the out-patients' departments and northwards of east and west pavilions and close to the north boundary. It is suggested that the southern portion of each pavilion should be erected now, leaving the northern portion for the future.

In examining the remaining designs it is perhaps surprising that there should be so much unanimity amongst the competitors that the scheme as now proposed for thirty beds should have all the wards on the ground floor. Even the successful competitor's scheme, No. 1, favoured this arrangement, and a very large proportion of the competitors were of opinion that the extended hospital of sixty beds should also be on the ground floor; the design placed third shows this can be done without crowding the blocks, but the assessor appears to have been influenced by the minority, or evidently holds the opinion that for a hospital of thirty beds on a site of nearly 2½ acres, the most desirable arrangement is to place fifteen beds on the first floor; and we believe the assessor was selected for his special knowledge of hospitals.

It is gratifying that the R.I.B.A. are considering the question of competition reform, and it is to be hoped this may lead to the reform that is desirable within the Institute.

A Stone Reredos has been erected at St. Peter's Church, Hereford. It is executed in Caen stone in the Gothic style, and a sculptured copy of Leonardo da Vinci's painting of "The Last Supper" forms the central panel. It is situated in the chancel, beneath the east-end stained-glass window. Other improvements have also been carried out. The wooden flooring in the sanctuary has been removed, and encaustic tiles, with a border of white marble, have been laid in its place; the position of the brass railing has also been altered, allowing a larger space in front of the altar. Messrs. Andrews & Son, Hereford, undertook the work, and the tiles were laid by Messrs. Godwin & Son, of Withington. The electric light has also been installed in the choir stalls and chancel. The work was carried out by Messrs. Harding Brothers, Hereford. A portion of the woodwork partition which divided the chancel from the vestry has been removed and replaced by coloured glass. This was executed by Mr. W. Rowberry, St. Owen Street, Hereford.



GALLERY OF SCOTLAND.

THE SILCHESTER EXCAVATIONS.

THE annual exhibition of discoveries made at Silchester—the site of the large Romano-British city which has been identified with the Calliva or Calleva Atrebatum of the Antonine Itineraries—has just closed. The area of 100 acres enclosed by the remains of the Roman wall, nearly two miles in circumference, is being more and more filled in by the foundations, traced with great precision, of the houses and public buildings of the city, and only a fractional part remains. Last year's labours were begun on May 10th, and continued without break until November 13th. The area examined was nearly six acres on the northern half of the town. The foundations of four houses were discovered, one being a small house with an eastern apse. Another of the four had been enlarged to more than double its original size, indicating, perhaps, the growth of a family or the acquisition of wealth. The plan is somewhat irregular and the lines are slanting, and the methods of communication between the older and the newer parts seem to have interfered considerably with the symmetry of the whole. The original structure was a complete

building of unusual construction and doubtful use. Of the fourth house—also of corridor type—little remained. It is not easy to conjecture the height of these houses. The walls were about 18in. thick, and it would seem mostly of flint and rubble, and, being of such material, cannot have been very lofty. The pits and wells yielded as usual a fair quantity of pottery and of pewter vessels, and also a fine pair of iron wheel tires on which no mark of the hammer is to be seen. In the current year it is proposed to excavate the area near the east gate, adjoining the churchyard of the parish church of Silchester. Funds are requested to maintain the high standard of efficiency of the last twelve years, and may be sent either to Mr. F. G. Hilton Price, 17, Collingham Gardens, or to Mr. W. H. St. John Hope, Burlington House, W.

A NEW "UNDERGROUND."

THE Whitechapel and Bow Railway, which has been constructed jointly by the London, Tilbury and Southend and the Metropolitan District Railway Companies, and which has just

where, passes immediately over the Whitechapel Station of the East London Railway, the roof of which it was necessary to remove and replace by two girder bridges of 53ft. span, thus cutting down the height of the East London station by 15ft. In the construction of the Bow Road Station, which is on a curve and very close to the surface of the street, a special construction of steelwork had to be employed; and beyond this station, where the new railway joins the main line of the Tilbury Company, an old bridge carrying the latter over Campbell Road had to be removed and a new one erected to carry the junction lines without interfering for a single day with the traffic of the Tilbury Company. Close to this junction, moreover, seven arches had to be cut out of a brick viaduct carrying the Great Eastern Railway, and three girder bridges substituted to carry that line over the new railway and over two new roads which it was necessary to construct in place of one stopped up. The engineer was Mr. C. A. Brereton, M.I.C.E., partner with Sir John Wolfe Barry, and the contractors were Messrs. Price & Reeves, of Westminster. In addition to the old District terminus at Whitechapel, which has been converted into a through station and more



TURIN EXHIBITION: GALLERY OF FINE ARTS

example of the courtyard type, with mosaic floors in most of the rooms. Two of these pavements have been put together with remarkable skill by Mr. Mill Stephenson, Mr. St. John Hope and Mr. A. H. Lyell, and were shown at the exhibition. A curious feature of this house is the foundation of an almost perfectly circular room, such extensions being usually either elongated or semicircular. Another singular circumstance—discovered from the debris on the pavement of the ancient ceiling—was that the house was half-timbered. Wattle work and plaster were combined, and large pieces exhibited in the room show the ruts in the plaster formerly traversed by the osiers or small branches which held the plaster together. The work resembles that which has been found in neighbouring cottages and has perhaps been traditionally followed from the days of the city's prosperity to our own. This half-timber work—familiar in such mediæval cities as Brunswick and Hildesheim—seems to have been widely prevalent, and remains have been found of Germano-Roman work—clay filling in a half-timber construction—on the banks of the Danube which present a likeness to what has been found at Silchester. Another house was also of the courtyard type, but of less importance and perhaps later date, and the mosaic flooring was of an inferior character. Additions had been made to it of winter-rooms, warmed by an elaborate series of hypocausts, and a

been opened for traffic, is interesting both as forming an important link in the chain of metropolitan communication and as being probably the last example which London will exhibit of the old type of underground railway construction. The new railway, which is about 2½ miles long, runs below the surface for more than two-thirds of its length, and for nearly the whole of this distance the tunnel has been constructed by the process known as "cut and cover." The only important exception is the section of about 50yds. passing under the Regent's Canal, where the line is carried in two cast-iron tubes, each 18ft. in diameter. This was done because there was not sufficient headroom under the canal for the brickwork tunnel to be put in. For the same reasons girders and "jack" arches carried on cement side walls were employed for a small section at the western end of the new line. For practically the whole of its length underground the railway runs beneath that great broad thoroughfare of eastern London which bears successively the names of Whitechapel Road, Mile End Road and Bow Road. In the taking up of the roadway two or three miles of old sewers had to be cut out and new ones in brick and concrete laid down on each side of the railway. About two miles of gas and water pipes have also been reconstructed, some of the new pipes being as large as 36in. in diameter. At the Whitechapel end the new line, which has here four tracks as compared with two else-

than doubled in size, there are three new stations—Stepney Green, Mile End and Bow Road. The buildings of these are still far from complete. The local traffic is of secondary importance to the through business which is expected to be done in the form of interchange traffic between the District Railway and its connections and the Tilbury system. There is an exceptionally large lighting and ventilating space at one side of the platforms, which almost converts them into daylight stations. The approaches to the stations are covered with white tiles, after the fashion of the Central London Railway.

Lombard Street and its Trade Signs.—In view of the fact that Lombard Street is to have its trade signs resuscitated for the Coronation, it is interesting to note that in former days some of the signs used to stretch across the street, and as many of them were of massive construction and the houses not of a particularly solid character there was always the danger of their falling. Indeed, there are cases on record of signs having pulled out the whole front of a house. Charles II. ordered the abolition of the hanging signs, and only permitted their use when they were confined to the balcony or fixed flat to the house. After the Great Fire many of the signs were carved in stone and built into the walls. In 1769 they were abolished altogether.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Architecture has its political use, public buildings being the ornaments of a country.

SIR CHRISTOPHER WREN.

Our Plates.

THE work done at the Manor-house, Normanton-on-Soar, for Mr. W. B. Paget, J.P., includes an entire remodelling of the old structure with extensive additions. Externally the building is faced with Woodville bricks and roofed with hand-made tiles, the half-timbering and other exposed woodwork being of English oak. Limestone obtained locally is also used, and the dressings are of Matlock stone. The hall and staircase and dining-room are lined with oak panelling; the hall has oak and the other rooms have maple flooring. The contractors were Messrs. William Moss & Sons, Ltd., of Loughborough. The joiner's work was by Mr. William Corah, of Loughborough, and the decorations were by Maple's, of London. Messrs Barrowcliff & Allcock, of Loughborough, were the architects.—The house at Stanstead, Caterham, Surrey, is nearing completion, and is built of brick, with local stone plinth and red-tiled roof. The ceilings, &c., on the ground floor are treated in modelled plaster by Mr. George Bankart. The builders of both house and stables are Messrs. Holt & Sons, of Croydon, and the architect is Mr. E. Guy Dawber, A.R.I.B.A., of 22, Buckingham Street, Strand, W.C.

Turkish Tiles.

SOME interesting tracings of sixteenth-century tiles from a mosque in Constantinople are on exhibition at the Architectural Association's premises at 56, Great Marlborough Street, W., till June 14th, from 10 to 7. They have been made from the originals by Mr. Arthur E. Henderson and are in colour: in fact they are facsimiles and look remarkably real. The decoration on them is of the conventional floral type adopted in Persian and Saracenic art, the prevailing colour being a rich blue, sometimes forming the ground and sometimes the pattern. Mr. Henderson was connected with Professor Millingen in the preparation of his book on "Byzantine Constantinople," and these tracings of tiles are well worth a visit. For permission to copy or trace them application should be made to Mr. Cole A. Adams, 66, Victoria Street, S.W.

Landulph Church Restored.

THE ancient church at Landulph is being restored. But for its grey old tower the church would now look like a new building. The north wall had gone so much out of the perpendicular that it was found necessary to pull it down and replace it stone by stone. The old windows and the walls and roof outside have been thoroughly repaired. In the course of the restoration of the north side a doorway was discovered which had been plastered up. This has now been thrown open. In the interior the old oak ceilings of the aisles have been repaired. That of the nave is entirely new. Six dormer windows have been placed in the roof, and these vastly improve the lighting of the church. Near the altar have been discovered the places where in olden days the holy vessels were cleansed, and these interesting receptacles are to be thoroughly restored. The fifteenth-century rood screen, on which is some very fine carving, is likewise to be renovated, and the old rood steps are still intact. The seats of the church had fallen into a ruinous state, and they have been removed and chairs substituted. Portions of the old seats are to be used in constructing screens for the chancel. The tower has been opened up, and the floor has been repaired with Delabole stone and wood. Altogether the renovations will cost £2,058. The architect is Mr. G. H. Fellowes Pryne.

Woolwich Rotunda.

THE Rotunda on Woolwich Common is, both inside and out, a museum of curiosities in the way of implements of war. But the main point of interest to-day centres in the building itself, which was erected in commemoration of a peace. In 1814, when peace was proclaimed, a grand gathering was held in London in a gigantic pavilion, many crowned heads being

present, including the Czar of Russia, the King of Prussia, and others, together with a galaxy of the great men of all nations. The nation was anxious to preserve the canvas pavilion which for a brief hour contained the cream of the regal, military, diplomatic and scientific power of Europe. With that view the pavilion was erected in a little space of ground between two wooded glens in a corner of Woolwich Common. Those who wished to preserve the canvas pavilion, and make it at once useful as well as ornamental, erected it in a dry spot and built over it an outer casing of brick, timber and lead; and so we see it at the present day: canvas walls within brick walls, and a canvas canopy within a leaden roof of substantial structure, rising to a cupola and vane over 100ft. above the ground.

Mr. Max Waechter and Richmond Hill View.

WHEN Petersham Lodge, which is the core of the Richmond view on the south side of the river, came into the market Mr. Max Waechter, High Sheriff of Surrey, secured that part of it which belonged to the Metcham family. He has now come to terms with the owner of the remainder, the Earl of Dysart, and will shortly be the owner of the freehold of the whole property. Writing to the Mayor of Richmond, Mr. Max Waechter says: "I am about to grant a lease of the property to the Princess of Wales' Holiday Home for Governesses at a nominal rent, and subject to stipulations for the maintenance of the exceptionally fine trees on the estate and certain building restrictions. Subject to this lease, and subject to similar stipulations as to the maintenance of trees and restrictions of building, I desire to offer the freehold to the town of Richmond with the object of preserving the view from Richmond Hill."

Engineering Notes.

The Derwent Valley Water Board New Offices, Bamford, have been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent Manchester grates and special inlet panels.

The Embankment Tramway.—On Thursday last the House of Commons again discussed the London County Council's scheme for connecting the tramways of South London with those of North London by a line across Westminster Bridge, and thence along the Embankment to Waterloo Bridge. From the latter point the line will cease to be on the surface but will plunge under the Strand, and, following the course of the new main avenue, will continue underground till Theobald's Road is reached. The Bill was carried.

A New Method of Shaft-sinking is being employed at the Washington Colliery, Durham, for the first time in this country, though it has been adopted in France. The colliery company had to get through 80ft. of quicksand and 230ft. of boulder clay. A ring of holes is bored, and into these holes are placed pipes into which a freezing mixture is pumped at a temperature of 2° degs. below zero. Thus a wall of ice is formed, and the material within the wall is excavated, enabling the stone head to be reached without any pumping.

Engineering Standards Committee.—In his private room at the House of Commons Mr. Arthur Balfour, M.P., accompanied by Mr. Arnold-Forster, M.P., recently received a deputation of the Engineering Standards Committee, together with the presidents of the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Iron and Steel Institute, and the Institution of Electrical Engineers. The various matters were put forward by Mr. Mansergh, Mr. Archibald Denny, Mr. Swinburne and Mr. Windsor Richards. Mr. Balfour in reply said he entirely agreed with the views expressed by the members of the deputation. It would be necessary for him to lay the matter before his colleagues, but he was authorised to say that both the War Office and the Admiralty were prepared heartily to co-operate with the efforts of the Committee in the direction of standardisation.

Law Cases.

The Scaffolding Question Again.—The case of *Marshall v. Rudeforth* came before the Court of Appeal on Friday last. This was an appeal from the decision of the Scarborough County Court Judge in an arbitration under the Workmen's Compensation Act, 1897. The appellant was a workman in the employment of the respondent, who was executing repairs to the roof of a house exceeding 30ft. in height, enable the workman to get on to the roof from the street a ladder was placed against the house one end of the ladder resting on the ground and the other end leaning against the parapet at the top of the house. There was no ladder, crawling board or other contrivance on the roof. The appellant was carrying slates up the ladder when the latter slipped, and he fell and was injured. It was admitted that the respondent was the "undertaker" within section 7. In proceedings to assess compensation under the Act the county-court judge held that the ladder was not "scaffolding" within the meaning of section 7, sub-section 1, of the Act, and that therefore the appellant was not at the time of the accident employed on, in or about a building exceeding 30ft. which was being repaired by means of a scaffolding, and that consequently the Act did not apply.—The Court dismissed the appeal. The Master of the Rolls said that after the decisions upon the question he confessed he was unable now to give a definition to the word "scaffolding" in terms which would necessarily exclude a ladder. But that was a very different thing from saying that the word scaffolding necessarily as a matter of law included a ladder; and they could not say that the county-court judge might not find, without misdirecting himself, that the ladder was not a scaffolding. The appeal, therefore, failed. Lord Justice Mathew said that he failed to see any ground whatever for saying that in law a ladder must come within the word "scaffolding." Lord Justice Cozens-Hardy concurred. It was impossible to hold that a ladder must be a scaffolding.

Correspondence.

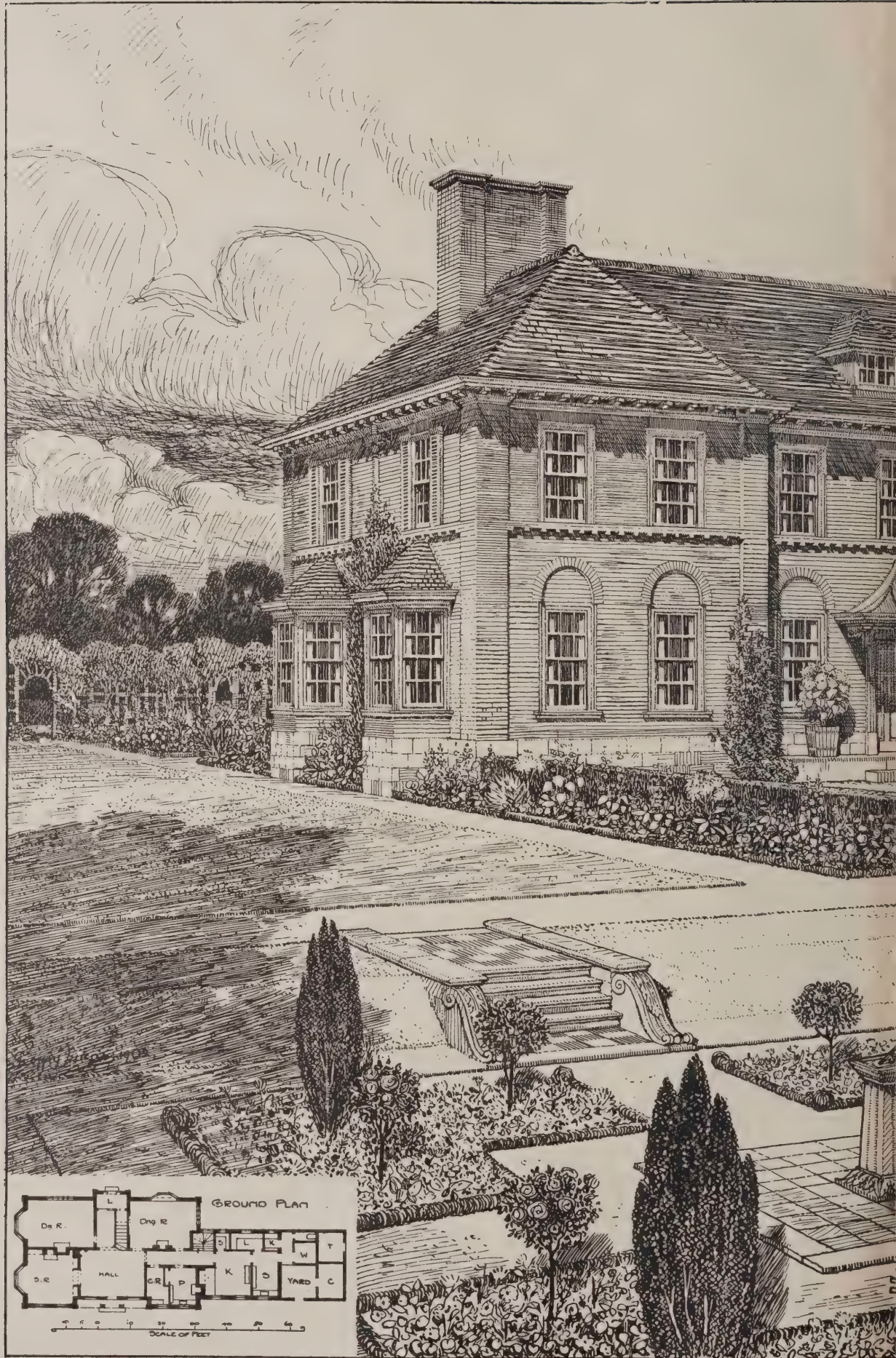
People's Baths.

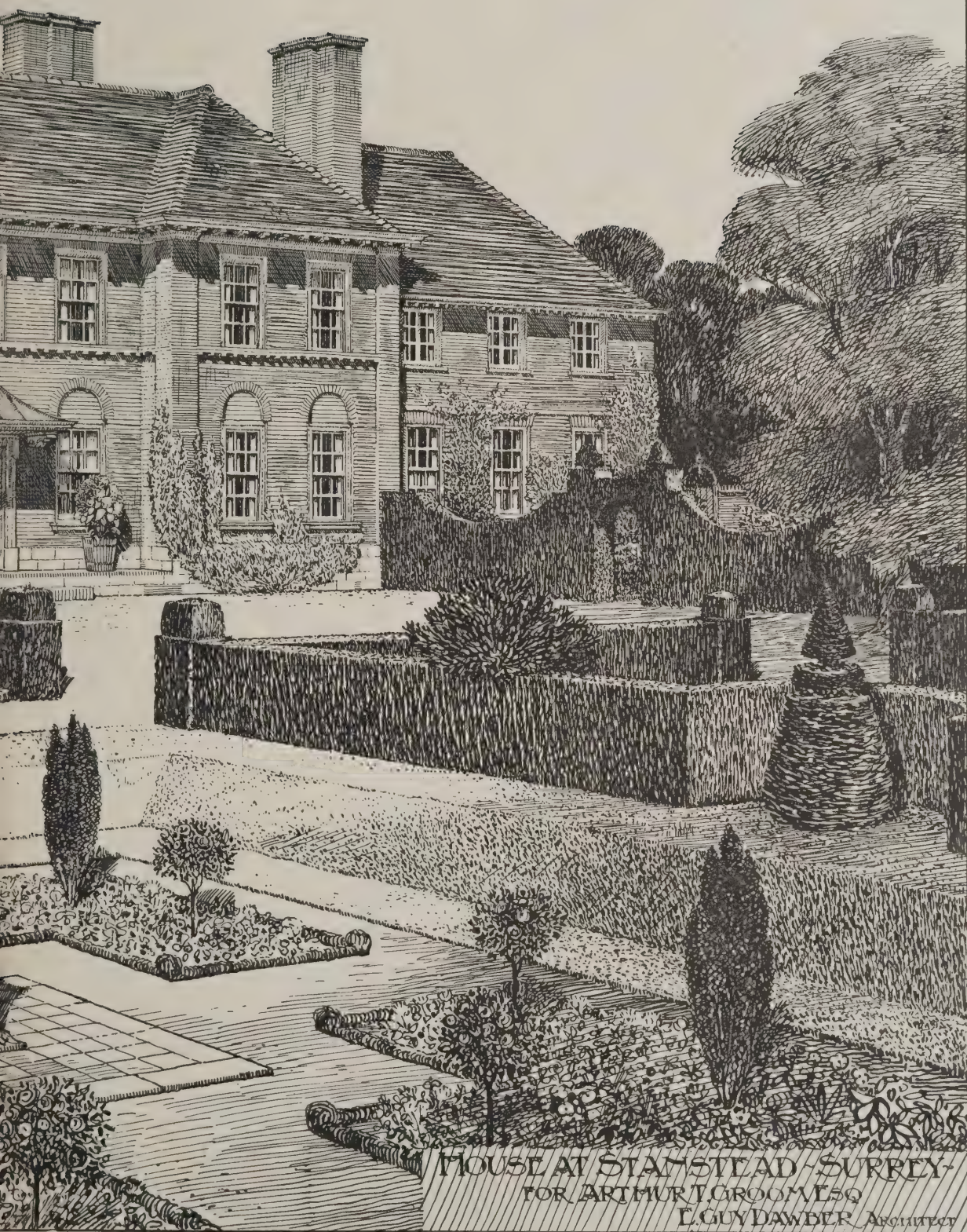
To the Editor of THE BUILDERS' JOURNAL.

CARDIFF.

SIR,—My attention has been called to the following statement in the paper on "People's Baths" by Mr. Walter H. Thomas, which appeared on p. 229 of your issue for May 28th:—"In England, however, no complete installation of people's baths has to my knowledge been erected, although the shower and spray bath have been introduced into existing and new public baths at Norwich, Cheltenham and Liverpool." I can only presume that Mr. Thomas was unaware of what has been done at Cardiff, and it may therefore be of interest to state that in 1896 the Corporation of Cardiff reconstructed their bath establishment in Guildford Crescent according to the designs of the borough engineer, Mr. William Harpur, M.Inst.C.E., substituting spray for the ordinary slipper baths in all cases (excepting the provision of two slipper baths in connection with the Jewess's plunge bath), the installation comprising ten first-class and twelve second-class men's baths, and five ladies' baths, each having dual dressing-rooms. It is true that this bath does not fall under Mr. Thomas' definition of a "people's bath," namely, "a public bath provided with spray and shower baths, but having no swimming baths," nevertheless it is essentially a people's bath in that the swimming ponds are virtually large plunge-baths, with the spray-baths arranged around the sides to enable the bather who has come for a wash (and who so wishes) to complete his hot bath with a plunge and a five minutes' swim instead of a cold shower. These baths are fully described in a paper I had the honour of reading before the Incorporated Association of Municipal and County Engineers at their annual meeting at Cardiff in 1899, which paper is printed in the proceedings of the Association for that year.—Yours truly, E. FOSTER.

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ADDITIONS TO THE MANOR-HOUSE, NORMAN



"PHOTO-LITHO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

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THE A.A. PLAY.

THERE is a farther North than ever Nansen saw, and there, beyond the ice and snow, "lies green land where the sun shines, and the flowers bloom all the year round." This is the land of "Arctia." 'Tis a long cry so far north, but one night have seen this ice-encircled Utopia and its various people for two nights last week in St. George's Hall, Langham Place; where young architects, in all the glory which may be given them, stood in the midst of their land of endless day and, as king or courtier or even sturdy viking, talked of love and hate and quantities. "The time has come to speak of many things." There is first of all the unsatisfied king of Arctia. Schillers may brood over the immensities of life, Shelleys sit shivering round the grave of it, or Walpoles talk of fiddle-addle; but there is only one subject for King Rudolph—the Pole. And thereby hangs the tale. For his daughter's hand suitors arrive by one and five, but their task is to find the Pole, and they go away disconsolate: and meanwhile the king's grief finds no assuagement, though his people would dive to the depth of the bottomless sea, or climb to the top of the tallest tree, or look till their eyes could no longer see, if only they could find him the Pole.

There is a queen who rules imperiously, is naughty, wilful, perverse, and a schemer withal: and it is one of her schemes that the princess Hilda shall marry the Architect-in-Chief. The choice is not, however, a popular one. A common architect "does not appeal to the public taste as material for a prince; yet he is a most uncommon architect—one of the successful ones—and certainly his attire is most uncommon, or with towering brassheadgear, a gown fringed with a deep band of sparkling scales, and a cloak of two colours hanging over his shoulders, he looks something like a mandarin with a decided reminiscence of the Medici and a suggestion of a second-hand clothes-store. But this architect-in-chief is a man of blood. If a tower collapses he hangs the builders, or the appearance of a town-hall be unsightly—well, the staff politely beheaded. Competitions used to bother him: he accordingly abolished them and made architectural design a state monopoly. As he tells us—

I've built temples by the score,
And of town-halls even more,
But my list of working drawings is quite brief;
They are wholesale and not retail,
For I use the same old detail,
That's the beauty of an Architect-in-Chief.

To the assembly who listens to this song comes news of a frightful monster that approaches with a great noise. Yet 'tis an airship only, and brings a band of flaxen vikings there. The prime minister takes them to the king—"they came in an airship, your whairship." Beowulf, who is in command of this exploring expedition, falls in love with the lovely princess, but the scheming queen strongly disapproves of the match, and entices her architect to invent a law against alien immigrants: it amounts to forgery, matter which nowadays is left to the "Goodie-goodies." The scheme, however, fails. The king finds among the archives an amendment to the law which removes the edict against the alien stranger if within twelve lunar months he discover the Pole; and thus with the farewells to the vikings as they go in search the curtain falls on the first act. There is not much to tell of the second act. The vikings return, and behold the magic rod with which Beowulf set out on his expedition, given into his hands by the princess, stands upright in fulfilment of the inscription which it bears. The king is mad with delight, the queen is outdone, and the noble viking becomes the happy man amidst the joyous shouts of the people. In the course of all these developments, however, the architect-in-chief tells of his profession in the following manner:—

A was an architect, old in his prime.
B was a builder who took his own time.
C was a client who had his own views,
D was the details that no one would use,
E the erection he tried to excuse,
F was the frontage exceedingly tight,
G was the ground plan exceeding the site,
H the half-timber he had to reveal,
I was the ironwork he had to conceal,
J was the joinery, mostly of deal,
K was the king-post that ought to have stood,
L the stone lintel that proved to be wood,
M was the mullion that blocked out the light,

N was the newel too thin for its height,
O the oak sill that was not water-tight.
P was the price on the contract agreed.
Q was the quantities down to a bead.
R was the rage that the client displayed; and
S the sarcastic remarks that he made—when
T was the total that had to be paid.
U was the umpire called on to decide.
V was the value the client denied.
W stands for the words that he said,
X was the extras for which he was bled,
Y Z the young zealot who wished he was dead.

The architect is not the only one who sings of his art. The king himself does so. He tells of the joys of architecture and of those "puppies" who learn it, who treat the office as a sort of social club, and play at office cricket with a tee-square as a bat and the fireplace as a wicket; and to these he sings this sweet refrain:—

Drink, puppy, drink.
Let every puppy drink
From the free-flowing fountain of knowledge;
You shall learn your little duty
To build in Truth and Beauty
At the Royal Architectural College.

So thus we leave the merry throng and merely subscribe the *dramatis persone*:—

Rudolph, King of Arctia . . .	Mr. G. B. Carvill.
Queen of Arctia . . .	Mrs. Stalman.
Prime Minister . . .	Mr. A. W. Benham.
Architect-in-Chief . . .	Mr. George Preston.
Beowulf (in command of Viking Exploring Expedition) . . .	Mr. F. Dare Olapham.
Sigard, Son of Seawolf, King of Fjordland . . .	Mr. Dalton Baker.
Laline } Ladies-in-Waiting {	Miss Sophie Tyler.
Viola }	Miss Ada Yerbury.
Silver Stick-in-Waiting . . .	Mr. Alec Smithers.
Gold Stick-in-Waiting . . .	Mr. Gervase Bailey,
and	
Princess Hilda (Daughter of the King and Queen of Arctia) . . .	Miss Emmie Gray.
Ladies and Gentlemen of the Court, pages and vikings.	
The play written by Mr. Gervase Bailey. Music by Mr. Leonard Butler.	

We must congratulate all concerned on the clever and happy manner in which the play was produced.

Surveying & Sanitation.

The Coronation Dinner of the Sanitary Institute was held last week. The chair was taken by the Duke of Northumberland. In proposing "The King," the chairman referred to the many services his Majesty had rendered to sanitary science. The King had taken a great interest in the housing question, which really included the greater part of sanitary science. The chairman, in giving "The Sanitary Institute and its president, the Duke of Cambridge," said that the great work the Institute had done was known to all. Referring to the museum of the Institute, he spoke of its cramped condition, and said that one of their duties was to find a better habitation for their really magnificent collection. For that object £3,000 had already been raised, but he trusted that amount would be largely augmented, and that they would soon be able to provide a museum worthy not only of the important and serious interests it was intended to represent but of the interests the Institute was formed to promote. He congratulated them on carrying their examinations far beyond the confines of the United Kingdom, and upon the continued interest they took in all the great sanitary movements of the day. Mr. Wynter Blyth, chairman of the council of the Institute, responded to the toast.

The Westminster Paving Works.—It will be remembered that an agitation arose last autumn in connection with what was known as the Westminster paving scandal. The Westminster City Council had adopted for the paving of the streets a practically untried wood called American red gum, and had given very large paving contracts for that wood to an American contractor named Edward Alcott. The Westminster Ratepayers' Committee (now the Westminster Municipal Association), after investigating the matter, felt themselves bound in the public interest to publish the facts, and in one of the circulars issued by them grave charges were made against Edward Alcott, amongst other persons, in regard to the mode in which the contracts had been obtained and performed. In October last Alcott brought an action for libel in respect of this circular, claiming £5,000 damages. Recently an order of the court was obtained, against which Alcott appealed

in vain to the Court of Appeal, directing him to disclose certain books and documents which the defendants alleged would establish certain of the charges made, and Alcott was accordingly called upon immediately to determine whether he was really in a position to face an impartial enquiry in a court of justice. It may now come as a matter of surprise to learn that last week Alcott applied to the Court for leave to discontinue the whole action; and in order to obtain such leave, and rather than proceed with the action, he submitted to the following stringent terms which were imposed by the Court:—That he should bring no other action in respect of the subject-matter of the alleged libel, and should pay all the costs incurred by the defendants in the action. There the matter ends, so far as Alcott personally is concerned, but the Westminster Municipal Association propose to call a public meeting with a view to inducing the proper authorities to cause a full and independent enquiry into the whole matter.

Builders' Notes.

Mr. Richard Hodkisson, builder, of Leamington, died recently at the age of seventy-seven years. He retired about fifteen years ago, when the business was transferred to Messrs. G. T. & T. Hodkisson, sons of the deceased. This partnership continued for some years, after which Mr. T. Hodkisson retired.

Glasgow Football Disaster: Stand Contractor Charged.—On Friday last Mr. Alex. McDougall, timber merchant, of Partick, was charged with culpable homicide in reference to the collapse of the football stand at Ibrox Park, for which he was the contractor. The main charge is that inferior yellow pine was used instead of red pine joists.

A Builder's Fire.—A fire occurred last week at a warehouse in Slad Road, Stroud, occupied by Messrs. Philip Ford & Son, builders, the ground floor being used as a store for joinery work, and the upper storey being let to a man named Levy for a tailor's workshop. The place was completely gutted. The damage is roughly estimated at between £2,000 and £3,000, and is covered by insurance.

The South Wales Building Trades Employers' Federation held its annual meeting last week at Cardiff, the president (Mr. William Thomas, Cardiff) presiding. The following officers were elected for the ensuing year: President and chairman, Mr. W. M. Blackburn, Newport; senior vice-president, Mr. B. Bennett, Swansea; junior vice-president, Mr. Watkin Williams, Pontypridd; treasurer, Mr. George Couzens, Cardiff; auditors, Messrs. W. O. Jenkins, Swansea, and W. James, Pontypridd; secretary, Mr. W. H. Billings, Swansea. Notice was given that the masons at Liverpool were on strike, and the secretary was instructed to take the usual steps.

The Barbican Fire: Verdict.—The jury found that there was no evidence to show what was the cause of the Barbican fire. They added a rider in which, among other things, they deprecated the use of matchboarding for ceilings and walls. Mr. Woodthorpe, district surveyor for the northern division of the City, who gave evidence, stated that the risk from fire in the rebuilt Cripplegate area was enormously diminished. The owners had done far more than they were compelled in order to provide fire-resisting buildings. In reply to the coroner the witness said he advocated concrete floors and roofs; iron and steel girders being embedded in concrete; brick, stone or teak partitions; plaster instead of matchboarding; and the enclosure of the staircase.

Registration of Plumbers.—The Executive Committee of the National Association for the Promotion of Technical and Secondary Education has passed the following resolution: "That the Plumbers' Registration Bill now before the House of Commons would be injurious to the best interests of education; and, having regard to the resolution against any Bill whatever passed at a representative conference of educational and industrial bodies held three years since under the auspices of the National Association, the committee considers that nothing has occurred to render desirable another decision on the subject, and therefore expresses the hope that the present Bill will not be allowed to pass."

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Incandescent Gas Light in Churches.

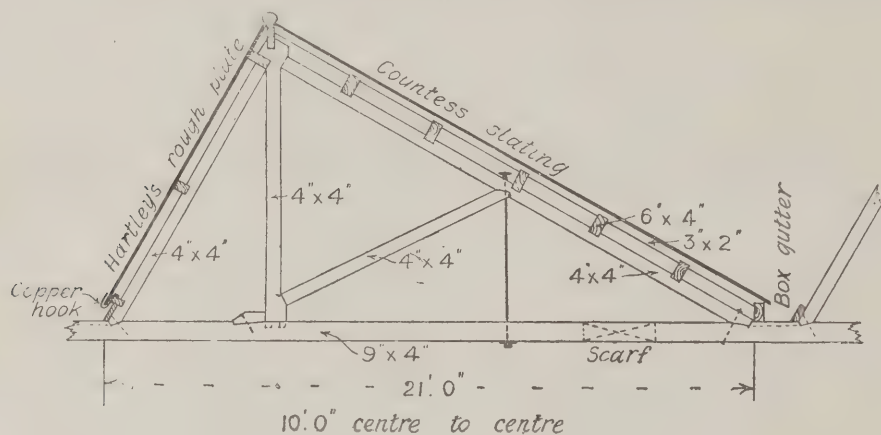
GODALMING.—KENT writes: "Is there any objection to the use of incandescent gas fittings when fixed to floor standards in a small church? It has been suggested that great trouble will arise owing to vibration, and that in this position the fittings are likely to be easily damaged."

So far as vibration is concerned, we see no objection to the use of incandescent gas fittings on floor standards in churches, presuming the standards to be pipes fixed to the pew ends, which is the usual practice. It must not be forgotten, however, that in such cases the light is generally very low down, and the incandescent light would need to be softened with suitable globes. If need be, anti-vibration fittings could be used.

Saw-Tooth Roof-Trusses.

LONDON, E.C.—H. L. writes: "Kindly give the usual correct form of truss for a timber saw-tooth (north light) roof. The span in question is about 21ft."

There is no standard form for a saw-tooth roof-truss. They are made with the long slope



30 degs., and the short slope on the northern side 60, 75 or 90 degs. The former will generally give the maximum amount of light and the latter the most uniform quality. The tie-beams may be scarfed where shown.

HENRY ADAMS.

Payment for Work not Carried out.

SABRINA writes: "A requests B to prepare plans, &c., for a residence and to carry out the work. B is informed by A's agent that the cost mentioned was £800, but that most probably £1,000 would not be considered excessive, and B's plans were for a house to cost not less than £1,000. Afterwards A and A's agent asked what would be B's charges, and for certain reasons they were told 5 per cent, which was not as much as the work was reasonably worth; this amount was agreed to. B also told A's agent (to avoid any future misunderstanding) that he was preparing the quantities, which would be paid for out of money paid to contractors. B prepared plans, details, specifications and quantities, and also tracings for the local authorities, which were passed by them and quite approved of by A. B was on the point of asking for tenders, when he was informed by A that for private reasons not financial (which he explained to B) he did not intend carrying out the work at present, and asked for the plans and papers and B's account. There is no dispute on any point between A and B. What would be a reasonable charge? Should A pay B for quantities?"

The plans and papers are the architect's property and need not be given up to the client

unless B wishes (see a reply on this subject on p. 214 of our issue for November 6th, 1901). Many well-known architects add a clause to the contract stating that the plans, tracings, details and specifications are the property of the architect, and that such plans, &c., must be returned to him either by the builder or employer or both; and, further, a note should be placed upon every drawing, tracing, &c., stating that it is the property of the architect. This makes matters clear from the first. In the case of fees, &c., too, another clause should be added stating that these are to be in all particulars in accordance with the R.I.B.A. printed schedule. B is entitled to 2½ per cent, upon the estimated cost for preparing plans, details and specifications and one set of tracings; extra for the trouble and time entailed in preparing extra tracings or drawings for the local authorities and correspondence with them; and an extra 2½ per cent, for quantities, for which A should pay.

Strength of Concrete Floor.

HAMILTON.—W. G. C. writes: "It is proposed to construct a floor of concrete over a basement. I cannot obtain trustworthy data regarding the strength of concrete slabs and the usually accepted necessity for introducing steel joists as stiffeners or supports. Taking the span at 15ft. and the load at 1½ cwt. per sq. ft., what would be the greatest width permissible in a slab of concrete 6in. thick; and assuming steel joists to be required between each slab, to what extent will the stiffness of the joists be increased? Also, what are the relative strengths of a beam, firstly, embedded in concrete, and secondly, under concrete? A

simple formula based on the strength of concrete with which to calculate these data would be highly appreciated."

There is a dearth of information about modern concrete floors, and I have in hand an extension of my "Practical Designing of Structural Iron-work" to make good this deficiency. A plain concrete floor 6in. thick composed of 1 part of Portland cement and 4 parts of ballast at the end of three months will carry an external load of, say, 3 cwt. per ft. super. over a span of 7ft. Small rolled joists embedded in concrete of 50 per cent, greater depth are practically doubled in strength; they are never placed underneath as shown in querist's sketch (not reproduced), as they then have only their normal strength. Rolled steel joists 6 by 2 by 12lb. embedded in concrete 7in. thick have been used over a span of 14ft. in public buildings. "W. G. C." is not the only one who would appreciate the introduction of a simple formula to cover the various cases that arise in practice.

HENRY ADAMS.

Morgues.

LEEDS.—DEAD MAN writes: "Kindly name some manufactures of fittings for morgues. I have one to deal with for a clinical hospital in which provision must be made for exhibiting twelve bodies, and a chilling chamber to keep bodies fifteen days, and for murder and criminal cases five to six months (two bodies)."

Mr. George Davis, of 28, Silver Street, Kensington, W., has executed several works of a similar nature to that mentioned, notably in one of the North London hospitals; he also installed the

catacombs at the new mortuary at Battersea. At this mortuary also there are galvanised iron coffins (on wheels) with a glass-fitted lid having a deep water seal. We understand Messrs. Bird & Co., 11, Great Castle Street, Regent Street, W., make similar coffins.

Gwilt's "Encyclopædia."

HULL.—A. G. writes: "Where can I get Gwilt's 'Encyclopædia of Architecture'?"

From Mr. B. T. Batsford, of 94, High Holborn, W.C., price 21s. nett.

Civil Service Appointments.

BOLTON.—SCOTSMAN writes: "Are vacancies like examiner in Office of Works, surveyors R.E. and Admiralty filled up, like those for surveyors in the Office of Works, by draughtsmen in their own office?"

See p. 451 of our issue for February 12th last.

Thick-outlining Drawings for R.I.B.A.

BOLTON.—PROBATIONER writes: "I am finishing a drawing of the monument of Lysicrates as one of my 'testimonies of study,' and have started thick-outlining it. Is it proper to do this with the foliated capital? I should also be glad to know how to obtain the correct entasis."

Thick-outlining is only to be used in sections; it is wrong in drawings of the Orders. For methods of drawing the entasis see p. 393 of our issue for January 24th, 1900.

Radius of Gyration in Stanchions.

BRIGHTON.—NEUTRAL AXIS writes: "How is the least radius of gyration in stanchions to be determined? Mr. Sloan tells us in his article on American steel construction in 'Specification, No. 5' that the neutral axis can be taken parallel or at right angles to the web, and on page 159 we are given an example worked out. In this case the neutral axis has been taken at right angles to the web, but if, instead, it had been parallel to the web the resulting radius of gyration would have been much less. The neutral axis is the basis of all the calculations given in the article, and to enable me to find the least radius of gyration I should like to know how to determine its position in the case of stanchions carrying eccentric loads due to girders butting on them, and running (1) parallel to the web, (2) at right angles to the web, (3) in the case of stanchions carrying a load applied vertically. Which of Professor H. Adams's books on steel-work deals with stanchions?"

The radius of gyration varies directly as the moment of inertia (for $r^2 = \frac{I}{A}$, and A, the area

of the section is always the same), and therefore to determine the least radius of the gyration we must find the least moment of inertia, which, as explained in "Specification," is around the neutral axis. In the form of stanchion referred to, the two axes have different moments of inertia, and the least is determined by comparison of the two calculated results. In stanchions it is most important that the radius of gyration should be as nearly as possible the same on all the axes of the stanchion section, as stated in the article, for failure would be in the weakest part. Now, in the example on p. 159, the radii of gyration are nearly the same on both axes, but in calculating the bending moment due to the eccentric load it is of course only necessary to take into consideration the neutral axis in the direction in which the eccentric load will come. In the example it comes on the axis X X, but if the girder butted parallel to the web the radius of gyration along the neutral axis parallel to the web would be considered. In the case of stanchions carrying a load applied vertically, failure would come as stated above on the axis having the least radius of gyration, and, therefore, the axis having this least radius is alone considered. Professor Adams deals specially with built-up steel stanchions in "Designing Iron-work: Second Series, Part II." (price 2s. 6d.), published at 60, Queen Victoria Street, E.C.

Our Insurance Schemes.—A pamphlet giving full particulars of the three insurance schemes which have been arranged for the benefit of subscribers will be sent on application to the manager, BUILDERS' JOURNAL, Effingham House, Arundel Street Strand, W.C.



NEW WORKHOUSE FOR THE STAMFORD UNION.

STAMFORD NEW WORKHOUSE.

NEW buildings have been erected for the Stamford Union at a short distance from Stamford on the Ryhall and Bourne Road. The site comprises about eleven acres, and provides ample space for extension. Accommodation for 175 has been made in the new buildings, which consists of five groups, viz., entrance building, board office, with board-room providing for forty guardians and officials, clerk's office, and a small relief station, main building, laundry and boiler-house, and infirmary. The entrance buildings are on either side of the principal approach, and comprise porter's accommodation, receiving wards and vagrant wards (vagrants of both sexes are provided for, principally on the cell system). The workhouse proper or main building has the administrative block in the centre, in the front of which is the master's house, and in the rear the dining-hall, kitchen, scullery, workrooms, matron's office and stores, bakery and flour store. Upon each side of the administrative blocks, and connected by corridors, are the quarters for the male and female aged and able-bodied classes, with the necessary day-rooms, officers' rooms, bathrooms, lavatories and offices. The laundry and boiler-house buildings are placed in a central position between the main building and infirmary. In close proximity to the boiler-house is the electric light house, with dynamo and accumulator rooms, the workshops, coal-house. The infirmary is in the north-west portion of the site, and is a complete building in itself, consisting of a central block from which corridors to the left and right lead to the male and female wards, which are divided up into apartments for the various classes of sick. The nurses will occupy the central building. All the walls of the wards are of hard, impervious plaster; the lavatories, w.c.'s, &c., are lined with glazed bricks. The internal angles of the walls, and between walls and ceilings, wall and floors, are quadrants; projections or

mouldings are absolutely dispensed with, so that there may be no lodgment of dust. The heating of the large infirmary wards is by hot water, and by means of stoves which are supplied with fresh air direct from the outside. The blocks are faced with stone and Stamford buff bricks for back portions and have slated roofs. The corridors and wards in the main building have dadoes of salt-glazed bricks. The lighting throughout is by electricity. Messrs. Walker & Slater, of Derby, were the contractors, and Mr. J. H. Morton, F.R.I.B.A., of South Shields, was the architect. The sub-contractors were:—Engineers and electric lighting, Messrs. Benham & Son, London; flushing tanks, Messrs. Adams & Co., York; painting, Mr. Ottewill, Derby; asphalted yards, Mr. J. Woolston, Stamford; slating, Messrs. Broadbent & Co., Glasgow; baths, Messrs. Twyford, Stourbridge; colouring of walls, Messrs. T. Hart & Son, Stamford.

Tramps do not enter the workhouse at all. They are accommodated in wards near the entrance gates. Separate bathrooms are provided, and the males are accommodated in small cells, and at the further end of the cell there is a door opening into a smaller cell, where the tramp has to do his allotted task before he is released. Stones making a certain weight are thrown down in this labour cell, and these the tramp has to break and pass through 2in. holes in an iron plate before he can bid farewell to the workhouse. The steel of iron bored with the 2in. holes, through which the broken stones have to be passed, is so arranged at the end of the labour-cell that when the tramp throws up the broken stones on it they fall through on to the ground outside the cell. All the warder has to do is to see that the tramp has cleared away the stones from inside his cell. In the infirmary, which comprises not only extensive wards and sitting-rooms for patients but also room for doctors and nurses and for special cases, beside each bed there is a sort of side-

board capable of being used for various purposes, including a pigeon-hole for the medicine bottles and glass. The dining room in the main block is so fitted up that it can be used as a chapel on Sundays. There are also shops in which the inmates can work at various trades. The total outlay on the new Union amounts to nearly £30,000. We are indebted to the "Stamford Guardian" for the above illustration.

Views & Reviews.

The Bases of Design.

The second edition of Mr. Walter Crane's "Bases of Design" has just been published in smaller size than the original volume. The book was reviewed at length in our issue for January 25th, 1899, and has not been materially altered except in size, a few errors of the first edition only being corrected. It seems to start somewhat awkwardly with a chapter on the architectural basis of design, followed by one on the utility basis. The order ought to have been reversed, for then the reader could have been naturally led on to the appreciation of functional expression in architecture and in design in general. Of course the division of a subject into chapters must necessarily be difficult in a subject so connected, and this is noticeable when it is remembered that material, method and conditions form part of the utility basis, and further that the racial, individual and collective influences are in a sense dependent on the climatic influence. The best plan would perhaps have been to treat the subject in general under the heading of utility, and then to have proceeded to deal with the various sides of the subject separately, making constant reference to the general introduction to show the intimate relation of the parts. The book is on the whole one of the most able practical contributions to the subject of design.

"The Bases of Design," by Walter Crane. London: George Bell & Son. Price 6s. nett.

New Patents.

These patents are open to opposition until July 14th.

1901.—Timber Carriers.—9,599, A. J. TENOW, Kungsgatan 11, and J. E. FLODSTRÖM, Wollmar Yskullsgatan 22; both of Stockholm, Sweden. The timber is discharged on to a travelling band having projecting arms, but the feature of the invention is that the ladder over which the band travels is so arranged on the wharf that it can be moved about to suit the exact position where the timber is taken. This is accomplished by sliding arms attached to the main framework.

Cement Briquettes.—9,617, A. C. DAVIS, 2, Downing Grove, Cambridge. The machine consists of a hopper divided into two parts for holding exact quantities of cement and water, rollers and paddles for mixing, and, underneath, a press having special dies. The machine is neat in appearance and is worked by a hand-wheel.

Doors for Cold-Storage Rooms.—10,468, A. J. WALLIS-TAYLER, 99, Belsize Road, St. John's Wood, and E. WHITEHEAD, 46, Dover Street, Piccadilly; both of London. Considerable loss is caused in cold-storage chambers by the opening of the doors; to minimise this, it has been usual to provide an ante-chamber. According to this invention, however, the latter is dispensed with, a cylindrical door being employed. The person steps into the centre of this and rotates the casing by means of handles, so that it is not possible to admit more external air into the cold chamber than the cubic contents of the door-chamber.

Lightning Conductors.—11,584, K. W. HEDGES, Emery Hill Street, Ashley Gardens, London, S.W. A horizontal conductor is run parallel with the eaves at each side and other conductors stretch over the roof, the whole being connected to earth. The conductors have spikes attached to them, these being made of wire twisted round and soldered; or they may be clamped in position.

The following specifications were published on Thursday last, and are open to opposition until July 22nd. A summary of the more important of them will be given next week. The name in italics is that of the communicator of the invention.

1901.—10,124, HIGGINS, drying, seasoning and impregnating wood. 11,010, ELLIOT, road sweepers. 11,637, TRIMMING, drawing-board apparatus. 11,644, HARDING, cement. 11,836, WHITWORTH, method of storing cement, &c. 12,277, TOWNSEND & BAKER, pivots for windows, &c. 12,452, TABOURET, ceramic, stucco or other decorations. 12,992, FAUX, stop hinges. 13,452, GRAHAM, artificial stone. 13,584, HADFIELD & BROWN, drainage of tramways. 13,611, WRIGHT & DARWIN, radiators for utilizing the waste heat generated by ordinary gas fires. 13,908, CHRISTOFF & HAACK, apparatus for finishing off the flanges of pipes and columns. 14,031, ROBINSON & STALEY, device for use in the manufacture of sanitary pipes, &c. 15,945, TAYLOR, mixing machine for concrete. 16,317, GOMERSALL, kitchen and other ranges. 21,060, MILLIKEN, fastenings of sliding window frames, &c. 25,106, ROCKWOOD, wood-mosaic art panels.

1902.—2,542, GIBSON, fastening rainwater pipes to walls. 4,670, BARNES, suspended window sashes. 4,912, FARRER, THORP & FARRER, window- and door-fastener or holder. 5,203, STEUART, machines for pulverizing, crushing and grinding. 5,995, PALMER, artificial stone blocks. 7,249, LAKE (*Brooks*), devices for preventing persons slipping on floors, &c., and to prevent the surfaces wearing away. 7,546, LINDENBERG, protecting metal roofs against the weather. 7,570, DEGENHARDT, glazing bars. 7,759, KREFT, presses for artificial stone, tiles, &c. 7,820, MATTHEWS & REED, testing of drains.

New Board Schools at Ely have been opened at a cost of £4,300. There is accommodation for 240 scholars in the mixed and 120 scholars in the infants' department. The schools are built in the Renaissance style, and are of red facing bricks, relieved with Bath-stone dressings. The architect was Mr. Edgar Down, A.R.I.B.A., Cardiff, and the contractor Mr. C. C. Dunn, Canton.

BUILDING NOTES AND MEMORANDA.—II.

By T. E. COLEMAN, F.S.I.

(Continued from p. 252, No. 382.)

THE following table provides a series of "constants of labour" dealing with the principal items of workmanship connected with building or engineering works:—

CONSTANTS OF LABOUR.

<i>Excavator's Work.</i>	Hours of Excavator.
Excavating in common soils over large areas as for roads, railways, &c., but exclusive of wheeling or removal	per yd. cube .8
Ditto in stiff clay, gravel, &c.	ditto 1.1
Ditto in solid chalk, lime concrete or soft rock not requiring blasting	ditto 2.2
Ditto in hard rock requiring blasting	ditto 6.0
Excavating in common soils in trenches as for foundations, drains, water mains, &c., but exclusive of wheeling or removal	ditto 1.2
Ditto in stiff clay, gravel, &c.	ditto 1.7
Ditto in solid chalk, lime concrete or soft rock not requiring blasting	ditto 3.2
Ditto in rock requiring blasting	ditto 9.0
Wheeling, not exceeding 50yds., including filling barrows	ditto 0.7
Add for wheeling every additional 25yds.	ditto 0.15
Return, fill in, and ram to foundations, &c.	ditto 0.7
Basketing earth from inside to outside of building, including filling baskets	ditto 1.0
Fixing and removing planking to sides of excavations, including struts, walings, &c.	per yd. super. 0.8
<i>Concrete Work.</i>	Hours of Labourer.
Mixing, wheeling, and depositing concrete in foundations, trenches, &c.	per yd. cube 3.3
Ditto ditto and levelling in layers 6in. thick	per yd. super. .9
Ditto ditto 12in. thick	ditto 1.5
<i>Bricklayer's Work.</i>	Hours of Bricklayer and Labourer.
Brickwork in thick walls as in foundations, retaining walls, and heavy engineering works, with joints left rough	per rod 58.0
Ditto in plain straight walling as to boundary walls, &c., but exclusive of picked facings and pointing	ditto 64.0
Ditto as in walls of ordinary buildings, including plumbing jambs, &c., but exclusive of picked facings and pointing	ditto 70.0
Ditto in walls 1 brick thick and under, and ditto	ditto 80.0
Extra labour to preceding items for selected facings and pointing to brick walls	per ft. super. .1
Rough axed arches, including pointing	ditto .4
Gauged arches, including pointing	ditto 1.0
Pointing brickwork in new work, when carried out as a separate operation, including raking out joints, cleaning and rubbing down and pointing with a neat-struck joint	ditto .1
Ditto ditto and tuck pointed	ditto 2.3
Pointing brickwork in old work in mortar, including raking out joints, cleaning and rubbing down, pointing with a neat-struck joint, fixing and removing scaffolding complete	ditto .2
Pointing brickwork in old work in cement, and ditto ditto	ditto .3
Rough cutting to brickwork	ditto .1
Fair cutting and rubbing to ditto	ditto .3
Brick-nogging laid flat in mortar	per yd. super. 1.0
Ditto on edge	ditto .8
Brick-flat paving in mortar	ditto .8
Brick on edge ditto	ditto 1.0

<i>Drainage Work.</i>	Hours of Bricklayer and Labourer.
Laying and jointing plain socket drain-pipes in cement, 4in. diameter	per ft. run .10
Ditto ditto, 6in. diameter	ditto .15
Ditto ditto, 9in. ditto	ditto .20
Ditto ditto, 12in. ditto	ditto .3
Ditto ditto, 15in. ditto	ditto .4
Ditto ditto, 18in. ditto	ditto .5
Ditto ditto, 21in. ditto	ditto .6
Ditto ditto, 24in. ditto	ditto .7
<i>Tiler's Work.</i>	Hours of Tiler and Labourer.
Pantiling laid dry	per square 3.1
Ditto bedded in mortar and pointed both sides	ditto 5.6
Plain tiling laid to 3½in. gauge and bedded in mortar	ditto 7.0
Ditto ditto 4in. gauge	ditto 6.3
<i>Slater's Work.</i>	Hours of Slater and Labourer.
Doubles (12in. by 8in.) slating, holed to gauge and laid complete	per square 6.0
Ladies (16in. by 8in.) slating, ditto ditto	ditto 5.3
Viscountess (18in. by 10in.) slating ditto	ditto 5.0
Countess (20in. by 10in.) slating ditto	ditto 4.6
Marchioness (22in. by 12in.) slating ditto	ditto 4.2
Duchess (24in. by 12in.) slating ditto	ditto 3.8
<i>Thatcher's Work.</i>	Hours of Thatcher and Mate.
Thatching roofs of farm buildings, labourers' cottages, &c., complete, but exclusive of fixing roof timbers	per square 5.8
Re-coating existing thatched roofs, including preparing old thatch to receive new	ditto 3.7
<i>Mason's Work.</i>	Hours of Mason.
<i>Bath stone.</i>	
Half plain or sawn work in beds and joints	per ft. super. .2
Rough sunk work in beds and joints	ditto .4
Plain face, rubbed	ditto .5
Sunk ditto, ditto	ditto .8
Moulded ditto, ditto	ditto 1.2
For circular work to any of the above items add 50 per cent.	
<i>Portland stone.</i>	
Half plain or sawn work in beds and joints	per ft. super. .4
Rough sunk work in beds and joints	ditto .8
Plain face, rubbed	ditto 1.0
Sunk ditto, ditto	ditto 1.5
Moulded ditto, ditto	ditto 2.2
For circular work to any of the above items add 50 per cent.	
<i>Hard York stone.</i>	
Half plain or sawn work in beds and joints	per ft. super. .7
Rough sunk work in beds and joints	ditto 1.4
Plain face, rubbed	ditto 1.6
Sunk ditto, ditto	ditto 2.1
Moulded ditto, ditto	ditto 3.2
For circular work to any of the above items add 50 per cent.	
<i>Granite.</i>	
Half plain work in beds and joints	per ft. super. 1.0
Rough sunk work in beds and joints	ditto 2.0
Plain face, fine axed	ditto 2.3
Sunk ditto, ditto	ditto 3.5
Moulded ditto, ditto	ditto 4.5
For circular work to any of the above items add 50 per cent.	
<i>Marble.</i>	
Half plain or sawn work in beds and joints	per ft. super. .8
Rough sunk work in beds and joints	ditto 1.5
Plain face, polished	ditto 5.0
Sunk ditto, ditto	ditto 7.5
Moulded ditto, ditto	ditto 11.0
For circular work to any of the above items add 50 per cent.	

*Mason's Work—cont.*Hours of
Mason and
Labourer.

<i>Masonry.</i>	
Rubble masonry in foundations, backs of thick walls, &c., with joints left rough - - - per yd. cube	2.8
Ditto ditto in walls, and ditto ditto	3.2
Rubble masonry in courses 9in. to 12in. high in walls, &c., including one bond stone in every 9 cub. ft., but exclusive of facings and pointing ditto	4.5
Ditto ditto with beds horizontal and joints vertical, the joints being squared at least 3in. from the face, but exclusive of facings and pointing - - - ditto	5.0
Extra labour to preceding items for roughly-dressed facings and pointing - - - per yd. super.	.5
Ditto ditto for hammer-dressed facings and neat-struck joint ditto	1.6

*Pavior's Work.*Hours of
Pavior and
Labourer.

8in. by 3in. by 6in. granite setts laid in parallel courses in gravel, including grouting with cement - per yd. super.	1.0
8in. by 3in. by 7in. ditto and ditto ditto	1.1
Taking up old granite setts in mortar, cleaning and stacking for reuse ditto	.2

Carpenter.

Note.—It is assumed that the timber is supplied to the workmen in ordinary scantling sizes and board or batten thicknesses where required.

<i>Fir timbers.</i>	
Fir fixed in wall plates, lintels, &c. - - - per ft. cube	.5
Ditto in floor joists, rafters, ceiling joists, &c. - - - ditto	.7
Fir framed and fixed in roof-trusses, &c. - - - ditto	1.1
Add extra to preceding items, if wrought - - - ditto	1.0
Fir proper door frames - - - ditto	3.2
Oak ditto ditto - - - ditto	4.5

<i>Centering, &c.</i>	
Centering for concrete flats, including fixing and removal - per square	5.8
Ditto ditto wrought one side, with flush joints and ditto - - - ditto	7.0
Centering for plain arches, or vaulting and ditto - - - ditto	8.5
Ditto for large plain groined arches, and ditto - - - ditto	12.5
Centering to trimmer arches, including fixing and removal - per ft. super.	.2
Ditto to door and window openings, and ditto - - - ditto	.4
Casing for concrete walls, including fixing and removal - per yd. super.	.7
Ditto ditto, wrought one side, with flush joints and ditto - - - ditto	.9

<i>Deal boardings and floors.</i>	
3in. rough boarding laid complete as to roofs, &c. - - - per square	2.4
1in. ditto ditto - - - ditto	2.5
1 1/2in. ditto ditto - - - ditto	2.7
3in. machine-prepared floor boarding, laid complete in batten widths as to floors, &c., including cleaning off ditto	4.8
1in. ditto ditto - - - ditto	5.0
1 1/2in. ditto ditto - - - ditto	5.3
1 3/4in. ditto ditto - - - ditto	5.6

<i>Deal doors.</i>	
3in. rough-ledged door, including hanging - - - per ft. super.	.16
1in. ditto ditto - - - ditto	.13
3in. wrought, matched and beaded ledged door, including hanging ditto	.30
1in. ditto ditto ditto - - - ditto	.35
Add if braced - - - ditto	.05
1 1/2in. wrought framed and braced door or gate, including hanging - - - ditto	.70
2in. ditto ditto ditto - - - ditto	.75
2 1/2in. ditto ditto ditto - - - ditto	.85
3in. ditto ditto ditto - - - ditto	.95
1 1/2in. framed four panel square and flat door, including hanging - ditto	.70
1 1/2in. ditto ditto ditto - - - ditto	.75
2in. ditto ditto ditto - - - ditto	.80
Add for each side if moulded - ditto	.1

*Carpenter—cont.*Hours of
Carpenter.

<i>Deal doors—cont.</i>	
1 1/2in. framed four panel bead butt and square door, including hanging ditto	.8
2in. ditto ditto ditto - - - ditto	.9
Add if bead butt both sides - ditto	.1
Add to preceding items, if hung folding - - - ditto	.1
<i>Sashes and frames.</i>	
Fir solid sash frames prepared for 1 1/2in. sashes - - - per ft. super.	.45
Ditto ditto 2in. ditto - ditto	.50
Deal-cased frames, with oak sunk sills complete, prepared for 1 1/2in. sashes ditto	.60
Ditto ditto for 2in. sashes - ditto	.70
Add extra to preceding items for circular heads (measured square) 100 per cent.	
1 1/2in. deal moulded bar sashes and hanging - - - ditto	.40
2in. ditto ditto - - - ditto	.43

*Smith's Work.*Hours of
Smith and
Labourer.

<i>Wrought iron pipes.</i>	
3in. wrought-iron pipes fixed with screwed ends, including bends, elbows, connections, &c., complete per ft. run	.10
1/2in. ditto, ditto - - - ditto	.12
3/4in. ditto, ditto - - - ditto	.14
1in. ditto, ditto - - - ditto	.16
1 1/2in. ditto, ditto - - - ditto	.19
1 3/4in. ditto, ditto - - - ditto	.22
2in. ditto, ditto - - - ditto	.25
<i>Cast-iron pipes.</i>	
2in. cast-iron pipes laid complete, including running joints with lead and caulking - per yd. run	.30
3in. ditto, ditto - - - ditto	.25
4in. ditto, ditto - - - ditto	.3
6in. ditto, ditto - - - ditto	.4
9in. ditto, ditto - - - ditto	.5
12in. ditto, ditto - - - ditto	.6
15in. ditto, ditto - - - ditto	.7
18in. ditto, ditto - - - ditto	.9
24in. ditto, ditto - - - ditto	1.4

*Plasterer's Work.*Hours of
Plasterer and
Labourer.

<i>Walls and ceilings.</i>	
Rendering with haired mortar to walls and ceilings - per yd. super.	.2
Render and set with fine stuff - ditto	.35
Render, float and set with fine stuff ditto	.5
Ditto ditto and set with putty and plaster - - - ditto	.6
Lathing with double fir laths - ditto	.2
Render and float with Portland-cement mortar 3/4in. thick, and set with Parian or Keene's cement - ditto	.9
Render with Portland-cement mortar 1/2in. thick, including smooth-trowelled face - - - ditto	.3
Render and float with Portland-cement mortar 1/2in. thick, including smooth-trowelled face - - - ditto	.8
Ditto ditto, and jointed in imitation of stone - - - ditto	1.0
Render with Portland cement, and rough-cast with mortar and gravel ditto	.6
For circular work to any of the preceding items add 50 per cent.	

Cornices and mouldings.

Plain cornices and mouldings in plaster - - - per ft. super.	.4
Ditto ditto in Portland-cement ditto	.5
Bead and quirk under 2in. girth in plaster - - - per ft. run	.07
Ditto ditto in cement - - - ditto	.10
Double or staff bead under 3in. girth in plaster - - - ditto	.12
Ditto ditto in cement - - - ditto	.15
For circular work to any of the preceding items add 50 per cent.	

*Colouring, &c.*Hours of
Labourer.

Limewhiting or colouring 1 coat - - - per yd. super.	.05
Ditto, ditto 2 coats - - - ditto	.09
Distemper in colours, 1 coat - ditto	.07
Ditto ditto 2 coats - - - ditto	.12
Clearcolle and whiten ceilings - ditto	.15

*Plumber's Work.*Hours of
Plumber and
Labourer.

<i>Lead flats, gutters, &c.</i>	
Milled sheet lead laid in gutters, flats, flashings, &c. - - - per cwt.	3.3
Ditto in cisterns, safes, sinks, &c., but exclusive of soldered joints - ditto	4.2
<i>Lead service pipes.</i>	
1/2in. lead pipes, fixed complete, including ordinary bends and running joints - - - per ft. run	.12
3/4in. ditto ditto - - - ditto	.14
1in. ditto ditto - - - ditto	.16
1 1/2in. ditto ditto - - - ditto	.20
1 3/4in. ditto ditto - - - ditto	.24
2in. ditto ditto - - - ditto	.28
<i>Soil and ventilating pipes.</i>	
2in. drawn lead pipes, fixed with lead tacks spaced 3ft. apart, including running joints, but exclusive of bends, &c. - - - ditto	.3
2 1/2in. ditto ditto - - - ditto	.35
3in. ditto ditto - - - ditto	.4
3 1/2in. ditto ditto - - - ditto	.5
4in. ditto ditto - - - ditto	.6
5in. ditto ditto - - - ditto	.7
6in. ditto ditto - - - ditto	.8

*Painter's Work.*Hours of
Painter.

<i>Plain painting.</i>	
Knot, stop, and paint 1 coat plain painting - - - per yd. super.	.30
Add for each additional coat - ditto	.15
Knot, stop, and paint 1 coat on fascias, eaves of projecting roofs, &c. ditto	.4
Add for each additional coat - ditto	.2
<i>Eaves gutters, &c.</i>	
Paint 1 coat on eaves gutters, rain-water pipes, &c., including preparatory scraping - - - per yd. run	.15
Add for each additional coat - ditto	.8

Sash or door frames.

Knot, stop and paint 1 coat on sash or door frames (one side) - - - each	.5
Add for each additional coat - ditto	.25
Knot, stop and paint 1 coat on sash squares - - - per doz. squares	.6
Add for each additional coat - ditto	.3

*Glazier's Work.*Hours of
Glazier.

Cutting and putting sheet-glass in new sashes - - - per ft. super.	.2
Ditto ditto in old sashes, including hacking-out old glass and painting rebate - - - ditto	.4
Cutting and putting 1/4in. plate-glass in new sashes - - - ditto	.3
Ditto ditto in old sashes, including hacking-out old glass and painting rebate - - - ditto	.5

*Paperhanger's Work.*Hours of
Paperhanger.

Trimming and hanging common wall papers - - - per piece	.8
Ditto ditto with full or half-satin papers in good work, including pumicing and sizing walls - - - ditto	1.2
Add extra to preceding items for papering to ceilings - - - ditto	.3
Add extra for stripping-off old paper, including washing, stopping and preparing old walls for new paper ditto	.7

The following particulars relating to the various weights and measures of building materials in ordinary use are grouped under their respective trade headings for convenience of reference:—

Earthwork.

1 ton as filled into carts=22 cub. ft. of sand = 23 cub. ft. of ballast, shingle or gravel = 18 cub. ft. of clay or marl=29 cub. ft. of chalk in lump=33 cub. ft. of earth mould.	
1 load=1 ton in weight=27 cub. ft. in bulk of ordinary materials.	
1 cub. yd.=27 cub. ft.=21 bushels.	
1 navy's barrow=1 1/5 cub. yds.	

Weight of Earths, &c. (Solid contents).

	Weight per yd. cub. Owts.	Increase of bulk when dry.
Sand - - -	30	1 1/2
Gravel or shingle - - -	30	1 1/2
Clay - - -	31	1 1/2
Chalk - - -	35	1 1/2
Sandstone - - -	39	1 1/2
Granite - - -	42	1 1/2
Slate - - -	43	1 1/2

(To be continued.)

ST. MARGARET'S CHURCH, POLMADIE, GLASGOW.

THIS church is the last of a series which has been designed for the late Dr. Macleod, of Govan. Great difficulty was experienced at the outset by the discovery that the ground was artificial, and that to about a depth of 30ft. it consisted of loose tipped-in soil filling up a disused clay-pit. But this difficulty has been successfully overcome by the construction of a complete fender of steel girders and concrete over the whole area covered by the buildings.

The church consists of a large nave with one side aisle divided from the nave by a high arcade of four stone arches. The chancel is a large one and contains oak choir-stalls, while at the extreme east end, on a platform elevated several steps, stands the oak communion table. The chancel is lighted by a three-light window in the gable and by two side-lights. Beneath the gable window there is a stone reredos with canopies, and arranged on either side are stone benches with dorsals for the elders. There is a large chapel on one side and an organ-chamber on the other. Near the entrance porch a vaulted baptistery has been built. The font is in the

THE GREATEST BRIDGES.

WHAT will be the largest bridge in this country since the Forth Bridge has just been commenced across the Tyne for the North-Eastern Railway Co. by the Cleveland Bridge and Engineering Co., Darlington. The contract price is £470,000. The present structure, built by Robert Stephenson, cost £190,000, and has three sets of rails and a roadway underneath for ordinary traffic. The new structure is for railway traffic only, with four sets of rails, and will have two enormous spans of 300ft. each across 600ft. of waterway, so that there will be only one central pillar in the river. In connection with this bridge a "M.I.C.E." writing to the "Daily News" has supplied some interesting facts. He says:—We must cross the Atlantic to find a suspension bridge which can compare with the cantilevers of the "Forth." The New York and Brooklyn suspension bridge has a maximum span of 1,600ft., which is therefore the second longest span of any existing bridge. These structures have been for a long time tabooed in England for the purpose of carrying railway traffic, and will in all probability never be again employed in that capacity. The Clifton

culminate, so far as length of span is concerned, in proportions so moderate that the less said about them the better. Their dimensions are about a third of those of the arched steel bridge across the Niagara River, a short distance below the Falls, erected three years ago. This structure has the unique and exceptional span of 810ft. The ordinary lattice bridge, of which that carrying the railway over the Thames at Blackfriars may be taken as a fairly good, though rather old, design, attains a span under more modern conditions of more than 500ft. The Britannia Bridge, of the tubular form, spans the Straits with openings 460ft. long; and Brunel's great work over the Tamar has a span of 455ft.: both these structures were built half a century ago. Lastly, a word may be said respecting bridges of masonry. While these will not be expected to attain to the dimensions of the more modern models, they come very near to a maximum span of 300ft. Until the other day the record for these structures was held by the bridge over Cabin John's Creek, in America, which had a span of 220ft. The latest example of masonry bridges is the great Luxembourg arch, with a principal span of 277ft. Half of this bridge is completed.



ST. MARGARET'S CHURCH, POLMADIE, GLASGOW. P. MACGREGOR CHALMERS, I.A., ARCHITECT.

form of a basin projecting from a large niche in the wall and supported on columns. The church is built of red freestone throughout in the transitional style from Norman to Early English. A certain piquancy is given to the design by the intermingling of round and pointed arches. The roofs are of dressel timber open to the ridges, and the floors of red tile.

The church is seated with chairs and accommodates 800 persons. The hall, which adjoins, is built of pressed brick and has a simple open-timber roof; it accommodates 300 persons. In close proximity to the church is the manse, which is of simple construction and, though small, very complete. The whole work has been carried out to the designs of Mr. P. Macgregor Chalmers, with Mr. R. Kelly as clerk of works. The cost is about £7,000. The contractors were:—Mason, Baras & Co.; joiner, Miller & Murry; plumber, Fyfe & Allan; plasterer, McKillan; sater, McQuat & Sons; glazier, Macdougall; gasfittings, Milne & Son; smithwork, Adam & Son; heating, Combe & Son; and oak furniture, James Grant.

A New House at Monks, Warnham, is being erected for Mr. C. F. Gill, K.C., the well-known barrister, from plans by Messrs. Wheeler & Lodge, architects, of Horsham.

Bridge can boast of a span of 700ft.; Telford's old design over the Menai Straits, which is eighty years of age, is good for 570ft.; and the Albert Bridge at Chelsea is content with a modest main span of 400ft. The corresponding dimensions of the other suspension bridges over our metropolitan river are somewhat less. It may be mentioned that the central spans of the Forth Bridge, gigantic though they are, will be thrown completely into the shade when the Americans build their contemplated suspension bridge over the river Hudson, with its stupendous clear stretch of 3,100ft. American engineers have estimated that the practical maximum span of suspension bridges is not less than 4,335ft., or just four-fifths of a mile.

When we turn to the iron and steel arch type of bridge the comparison of ourselves with other countries is very marked. It is true that so far as cast-iron is the material employed old Southwark Bridge, with its central span of 210ft., still holds the record. Sunderland Bridge, over the Wear, comes next, with a span of 236ft. There are two cast-iron bridges in the Severn Valley—the Victoria, opened in 1861, and the Albert Edward, three years subsequently. These arches have each a span of 200ft., and are the largest examples ever built to carry railway traffic. Our own specimens of wrought-iron and steel arches

Masters and Men.

The Dispute at Bristol is to be referred to an arbitrator. The masters in December last served a six months' notice upon the various operative societies connected with the building trades for a reduction of wages and an alteration in rules. This has been considered by the various societies, and interviews have taken place between representatives of the two parties. The operatives have resisted the proposals, and the members of the Master Builders' Association, after reconsidering the matter, offered conciliation through the medium of the Board of Trade. All the societies, with the exception of two, namely, the masons and the bricklayers, accepted the proposal. This appeal to the Board of Trade is made under the Trades Dispute Act of 1896, under which two aggrieved parties can make representation to the Board of Trade, who then appoint a conciliator. The joint application was despatched at the end of last week, and the two societies who objected to this course of procedure were informed of the fact. The masons have since intimated to the Masters' Association that they would reconsider their decision, which will shortly be communicated.

Keystones.

A List of the Old Churches of Devon, by Mr. Harbottle Reed, architect, of Exeter, is given in No. 2 of "Devonia," a publication of the United Devon Association, 17, Bedford Circus, Exeter (price 2d.). An outline map is also given.

Kylemore Castle and Estate, in the heart of Connemara, county Galway, Ireland, will be put up for auction on June 18th by Messrs. H. E. Foster & Cramfield, auctioneers, of 6, Poultry, E.C. The castle occupied seven years in erection; it was begun in 1864. The architects were the late Mr. S. Usher Roberts and Mr. J. F. Fuller, F.S.A.

The Memorial to Archibald Forbes, the famous war correspondent, which has been placed in the crypt of St. Paul's Cathedral, consists of a slab of Brazilian green onyx measuring 4ft. by 2ft. 9in. In the centre is a portrait medallion in bronze, and a bronze wreath of holly and laurel tied with a silver ribbon, surrounds the portrait. The tablet was designed by Mr. H. C. Fehr, and executed by the Art Memorial Co., of West Norwood.

A New Board School at Newhaven has been erected. The total cost is about £9,000. The architect is Mr. H. Ward, of Hastings; the builder, Mr. Mark Woolgar, of Newhaven; clerk of the works, Mr. J. H. Kempsted. It is built of red bricks and rough-cast. The walls of the rooms are of brown-glazed bricks with a blue string-course, forming a kind of dado. The whole building is fitted with hot-water apparatus by Messrs. Upfield & Sons, Hastings. The classrooms have air shafts and Boyle's patent ventilators.

New Police Court Buildings at Loughborough are being erected in extension of the present block. Messrs. Everard & Pick are the architects. The new block will consist of a court-room, hall, two magistrates' retiring-rooms, and magistrates' clerks' room, with lavatories attached. The elevations to Wood Gate are to be faced with white bricks, with Ketton stone dressings. The roofs are to be covered with old Swithland slates. The building contract has been let to Messrs. W. Moss & Son, of Loughborough, for £4,599.

New Baths for Holborn have just been completed in Broad Street. The architects were Messrs. J. & S. Flint Clarkson. The bath is contained in a hall measuring 105ft. by 4ft., with a height of 35ft. from the water. Included in the whole building - which is an extension of the old baths in Endell Street - are nineteen first-class and thirty-seven second-class private baths for men and seven first-class and eight second-class baths for women, and a large second-class swimming bath. There are also club-rooms for the use of swimming clubs, a committee-room and a large laundry.

The Garden City Association has decided to come before the country with a company having a capital of £20,000 to purchase an estate for the purpose of putting their principles into practice. This was approved at a meeting held last week at the Holborn Restaurant. A letter was read from Messrs. Emmerson, surveyors, Hull, in which they stated that it was their intention to build 1,000 houses, with 600 sq. yds. of garden to each, at a total cost of about £420,000. The company for carrying out the scheme was called "The Yorkshire Garden City Association, Ltd.," and it was intended to follow the plans of Bournville and Port Sunlight.

Patenting during 1901.—The Comptroller-General's annual report for 1901 shows that there were 26,777 applications for patents, and that the surplus of receipts over payments was £107,291, an increase of £1,867 over 1900. The total cost of the new Patent Office, off Chancery Lane, including the site and £6,800 for furniture, has been £163,750. During 1900, 331 complete specifications were accepted under the class "Buildings, &c.," 110 under "Cements, &c.," chimneys, &c., 48; closets, &c., 133; drains, &c., 57; hinges, &c., 114; sewage, &c., 47; and ventilation, 51. During 1901, 22 trademarks relating to manufactures for building and decoration were advertised and 20 registered, and in the class of "Engineering, architectural and building contrivances" 40 were advertised and 37 registered.

A New Vicarage at Sutton is being erected on a site in New Street by Mr. Thomas Woods, of St. Helens, from plans by Messrs. Willink & Thicknesse, Liverpool. It will be of red Ruabon bricks, with a red tile roof. The total cost will be about £2,500.

A Bronze Statue of Major Prince Christian Victor, of the King's Royal Rifles, who died in South Africa, is proposed to be erected at the foot of Thame's Street Hill, Windsor, in a recess by the Dean's Yard. The work was originally entrusted to the late Mr. Onslow Ford, who died within a few days after the commission was given to him. The work has now been placed in the hands of Mr. Goscombe John, R.A., and will be executed within the next twelve months.

A Monument in Valenciennes has been erected to commemorate the heroic defence made by that city in 1793. The statue of "Defence," set on a column, is the work of M. Gustave Crauk, and is a replica of the sculptor's "Victoire" in the Square des Arts et Métiers. A Musée Crauk, containing about 200 of the artist's best works, and to the memory of Eugène Guillaume, the old architect of the Palais du Louvre, has also been opened. Both men were born in Valenciennes.

A Discovery of Idols.—In the neighbourhood of Dan some natives, under the direction of M. Durighello, the eminent French architect, were excavating, when one of them dug up bronze statues which proved to be the Jewish idols mentioned in the Bible. One represents Baal, the other Astarte. The hair of both is plaited. Astarte wears an ornament resembling a crown, and the arms are crossed on the breast. Baal's forearm is stretched forward, as if commanding. These treasures show traces of fire. They have been placed in the Musée Guimet, Paris.

A New Chapel at Tonbridge School has been erected from designs by Mr. W. Campbell Jones, A.R.I.B.A. It will seat 500 persons. Two bays, cloisters and permanent vestries, however, remain to be added when funds permit; the total cost will amount to £23,000 or £24,000, of which about £9,000 has still to be raised. The chapel is of fine proportions, and chiefly built of Kentish sandstone. The roof internally is constructed of pine, which has been painted and decorated in a simple scheme of grey, black and yellow by Mr. Louis Davis. The length of the completed building will be 156ft. internally by 41ft. wide, and the height from the floor to the top of the arched ceiling is 58ft.

The Hermes of Cythera.—M. André, of Paris, has undertaken the reconstruction of the statue commonly known as the Hermes of Cythera. The statue was found at the bottom of the sea in January last year, is a bronze life-size figure of an athlete of extraordinary beauty, and is of the best workmanship. The head, arms and upper part of the torso are in excellent preservation; of the rest of the body, both legs have been found, as well as a considerable number of smaller fragments. The almost complete reconstruction of this priceless work of ancient art is therefore possible. It was at first decided to invite Messrs. Stülm, of Vienna, whose marvellous success in piecing together the fragments of a bronze statue found at Ephesus has been universally recognised, to undertake the restoration. Messrs. Stülm, however, insisted that the statue should be sent to their studio at Vienna, while the Greek Government declined to allow it to be removed from Athens.

A New Church at Bryn, Port Talbot, has been erected at a cost of about £5000. The church is built with native stone, chisel bedded, with Bath stone quoins and dressings. The whole of the interior woodwork is of pitch-pine; the floors, except the aisles, are of wood blocks, the aisles being paved with red adamantine quarries. The interior structure of the church itself is of red bricks, with Bath-stone dressings. The size of the church is 60ft. by 30ft., the chancel 30ft. by 15ft., with a vestry 12ft. by 12ft., and under the latter is a heating chamber. The lighting is by means of acetylene gas, fitted by Messrs. Bailey & Claysham, of Keighley. The contractors were Messrs. Lattey & Co., Ltd., Cardiff, and the architect was Mr. F. B. Smith, of Port Talbot and London. The seating, choir stalls, reading-desks and pulpit are of pitch-pine, and are the handiwork of Mr. John Phillips, of Altrincham.

The Arts and Crafts Exhibition Society will hold its next exhibition, not in the autumn of this year, but in January next, at the New Gallery.

A Gloucester Architect's Affairs.—A first meeting of the creditors of Mr. H. B. Guest, architect, of Gloucester, was recently held. Debtor's gross liabilities were placed at £4,015 8s. 4d., of which £3,264 were to four fully-secured creditors, and there was an estimated surplus of £77 9s. 8d. on the whole estate. Debtor alleged as cause of failure "unwise buying of land and building thereon, and inability to realise the same."

Rutherglen New Parish Church has just been completed from designs by Messrs. J. Burnet & Son, architects, St. Vincent Street, Glasgow. It has been erected at a cost of £10,000. The painting and decorations in the interior of the church have been executed by Messrs. Bryson Brothers, Glasgow and Rutherglen. The furnishings are by Messrs. Mann, Byars.

New Sunday Schools at Kidderminster have been erected from plans by Messrs. Ingall & Son, of Birmingham, in connection with the Milton Hall, Kidderminster. The premises comprise a central schoolroom—size, 44ft. by 30ft.—with classrooms opening out on three sides. There are also a number of classrooms around the gallery, which runs along one side and the end of the schoolroom. A small staircase leads from the superintendent's platform to the upper classrooms.

The Gavarni Monument, the work of MM. Denys Puech, the sculptor, and Henry Guillaume, the architect, promises to be exceedingly characteristic of the subject. A bust in bronze will stand on a pillar, which will be decorated by figures in marble copied from the works of Gavarni. The fountain at the base will be decorated with quaint heads of the essentially French types made popular by the artist—the "lorette," the "étudiant," the "débardeur," and the "chicard." From the mouths of these will issue the jets of water.

A New Liberal Club at Neston, Cheshire, was opened recently. The building consists of large hall with gallery and stage capable of seating in all about 700 persons; billiard-room for three tables, which can also be thrown into large hall, by means of folding screens; dining-room, cloak-room, committee rooms, kitchen and servery, secretary's office, four bathrooms and heating chamber, and cellars in basement. A verandah has been placed along the west front which overlooks the bowling-green. The walls are of brick with red pressed-brick dressings and white plaster gables. The roof is covered with green slates. The internal work is pitch-pine varnished. The heating is by low-pressure hot-water pipes and radiators. The contract has been carried out by Mr. James E. Evans, of Neston. The heating was done by Mr. Lewis Hill, Liverpool, and the architect was Mr. T. T. Rees, F.R.I.B.A., May Buildings, North John Street, Liverpool.

COMING EVENTS.

Wednesday, June 11.
GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.
SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.—General Meeting at Burlington House at 3 p.m.
JAPAN SOCIETY.—Annual General Meeting.

Thursday, June 12.
SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

Friday, June 13.
PHYSICAL SOCIETY.—Meeting at 5 p.m.

Saturday, June 14.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to St. Monans Church, Fife.
ARCHITECTURAL ASSOCIATION.—Second Summer Visit to Shiplake Court, Henley-on-Thames (Messrs. Ernest George & Yeates, architects), at 12.30. Camera and Cycling Club ride to Cobham, Surrey.

Monday, June 16.
ROYAL GEOGRAPHICAL SOCIETY.—Dr. M. A. Stein on "Geographical Archaeological Explorations in Chinese Turkistan," at 8.30.

Wednesday, June 18.
NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion to Gaidhall, Newcastle, at 6 p.m.

Thursday, June 19.
SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.
SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Annual Dinner.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
June 12	Chapelthorpe, Wakefield—Church Works	F. M'Laughlin	Rev. L. Busch, Chapelthorpe Vicarage, Wakefield.
" 12	Londonberry—Villa	J. P. M'Garth, 28 Carlisle Road, Londonderry.	
" 12	Brighton—Pavilion at Sanatorium	F. J. O. May, Borough Engineer, Town Hall, Brighton.	
" 12	Hastings—Boundary Wall	A. W. Jeffery, 5 Havelock Road, Hastings.	
" 12	Allerton Bywater, Yorks—House	A. Hartley, Architect, County Chambers, Castleford.	
" 12	Bingley, Yorks—Additions to National Schools	W. R. Nunn, Architect, Market Street, Bingley.	
" 12	Clayton, Yorks—Boiler-house, &c.	S. Spencer, 344 Great Horton Road, Bradford.	
" 12	Greatham, nr. Horncastle, Lincs—Church Restoration	Boreham & Morton, 24 John Street, Sunderland.	
" 12	Omagh—Chapel	J. L. Donnelly, Architect, Omagh.	
" 12	Newmarket—Portland Cement	S. J. Ennion, Clerk, Deva Chambers, Newmarket.	
" 12	Pentre, Wales—Ten Urinals, including Brickwork, &c.	W. J. Jones, Engineer, Council Offices, Pentre.	
" 12	Tanerdy Farm, near Nantgaredig—Oat-Houses	T. Howell, Godor Farm, Nantgaredig.	
" 12	London, S.E.—New Flooring to Workhouse Dining Hall	G. D. Stevenson, 13 & 14 King Street, E.C.	
" 12	Edinburgh—Gofer's Shelter, Tool House, &c.	R. Morham, City Architect, Public Works Office, City Chambers, Edinburgh.	
" 13	Wortley, Leeds—Sixteen Sullery Houses	W. S. Braithwaite, 6 South Parade, Leeds.	
" 13	Little Mill, Mon.—Farm House	E. J. Williams, 31 High Street, Cardiff.	
" 13	Manchester—Underground Lavatory	City Surveyor, Town Hall, Manchester.	
" 13	West Cornforth, Durham—Club, Hall & Manager's Ho.	H. T. Gradon, Architect, Market Place, Durham.	
" 13	Bradford—Laundry, Cookery, &c., at School	T. Garbutt, Clerk, Board's Office, Manor Row, Bradford.	
" 13	Brighouse—Silk Mill, &c.	G. Hepworth, 20 Bradford Road, Brighouse.	
" 13	Cork—Residence and Offices	W. H. Hill & Son, 28 South Wall, Cork.	
" 13	Deal—Orphanage at Convent	Convent, West Street, Deal.	
" 14	Devonport—Brick Culverts	Borough Surveyor, Devonport.	
" 14	Hadley, Salop—Cemetery Chapel Lodge	C. R. Dalgleish, Architect, Central Chambers, Wellington.	
" 14	Carlisle—Extensions to Asylum	J. T. Kelly, Clerk, Lunatic Asylum, Castlebar.	
" 14	Carlisle—Five Houses	Johnstone Brothers, 39 Lowther Street, Carlisle.	
" 14	Idle, near Bradford—Sunday Schools	J. P. Kay & H. W. Long, 10 St. Paul's Street, Leeds.	
" 14	Lodion, Norfolk—School Enlargement	A. Pells, Architect, Beccles.	
" 14	Skewen, Wales—School for 440 Boys	J. O. Rees, Architect, St. Thomas' Chambers, Neath.	
" 14	Cothi Bridge—Renovation of Chapel	E. Thomas, Fynodillo, Nantgaredig.	
" 14	Presteign—Alterations, &c., to School	R. W. Thomas, Architect, Victoria Chambers, Llandrindod, Wales.	
" 14	Glasgow—Farm Colony Block	A. Skirving, 121 West Regent Street, Glasgow.	
" 16	Tal-y-llyn, near Brecon—Four Cottage Villas	H. Waters, Architect, Beaumont.	
" 16	Owmaman, Wales—Classrooms, &c., to Chapel	G. Thomas, 12 Fforcharn Road, Owmaman.	
" 16	Heywood—Portland Cement, Lias, Lime, &c.	J. Diggle, Water Engineer, Board's Offices, Heywood.	
" 16	Birkdale—Cemetery Chapel and Lodge	A. Schofield, 45 Weld Road, Birkdale.	
" 16	Dewsbury—Covered Market	H. Dearden, Borough Engineer, Town Hall, Dewsbury.	
" 16	Mansfield—Alterations, &c., to Town Hall	R. F. Vallance, Borough Surveyor, Mansfield.	
" 16	Mansfield—Alterations, &c., to Public Baths	R. F. Vallance, Borough Surveyor, Mansfield.	
" 16	Worthing—Brick Chimney Shaft	Borough Surveyor, Municipal Offices, Liverpool Road, Worthing.	
" 17	Rugby—Five Shops, Assembly Hall, &c.	J. T. Franklin, Architect, Regent Street, Rugby.	
" 17	London, N.—Schools	J. Moule, Clerk, Brettenham Road, Upper Edmonton.	
" 17	London, W.C.—Workmen's Dwellings	Architect's Department, Housing of Working Classes Branch, 19 Charing Cross Road, S.W.	
" 17	Wyndham Row, Cumberland—Alterations to Schools	W. G. Scott & Co., Architects, Victoria Buildings, Workington.	
" 17	London, N.W.—Workmen's Dwellings	K. D. Young, 17 Southampton Street, Bloomsbury, W.C.	
" 17	Southampton—Nurse's Home at Hospital	Rnalt & Young, 17 Southampton Street, Bloomsbury, W.C.	
" 17	Pontyrryl, Bridgend, Glam—Additions, &c., to School	D. Edmonds, Clerk, Chapel Bach, Llangonoyd, near Bridgend.	
" 17	Cross Keys, Mon.—Alterations, &c., to School	E. H. Johnson, Architect, Risca.	
" 17	Leeds—Shops and Warehouse Premises	T. Wynn & Sons, 92 Albion Street, Leeds.	
" 18	Hemsworth, near Wakefield—Workhouse Infirmary	T. H. Richardson, Architect, Hemsworth.	
" 18	Bristol—Relief Culvert	T. H. Yabbicom, 63 Queen Square, Bristol.	
" 18	Halifax—Alterations	F. Fielding, 7 Fountain Street, Halifax.	
" 18	Hull—Rebuilding Inn	J. H. Hirst, City Architect, Town Hall, Hull.	
" 18	Rhos, near Ruabon—Chapel	R. Owens & Son, 3 Crosshall Street, Liverpool.	
" 19	London, N.W.—Public Conveniences	O. E. Winter, Borough Engineer, Town Hall, Haverstock Hill, N.W.	
" 19	London, W.—Branch Library	C. Jones, Borough Engineer, Town Hall, Ealing, W.	
" 19	London, W.—Engine and Accumulator Rooms, &c.	F. H. Medhurst, 13 Victoria Street, S.W.	
" 19	Hampstead, N.W.—Public Conveniences	O. E. Winter, Borough Engineer, Town Hall, Hampstead, N.W.	
" 20	Broomhill—Store Premises and House	T. Tulip, Whinney Hill, Chippington.	
" 20	St. Just, Cornwall—Renovation and Reseating Chapel	J. Maddern, Pendean, St. Just.	
" 20	Kilbeggan—Convent Chapel	W. H. Byrne, 20 Suffolk Street, Dublin.	
" 21	Dundee—Masonry, &c., for Bridge	W. Mackison, 91 Commercial Street, Dundee.	
" 21	Halifax—Five Houses	C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.	
" 21	Grimethorpe Colliery, near Cudworth—Church	Boreham & Morton, 24 John Street, Sunderland.	
" 21	Hatton, near Warwick—Private Lunatic Asylum	E. Manell, 47 Temple Row, Birmingham.	
" 23	Shepherd's Bush, W.—Workhouse and Infirmary	Giles, Gough & Trollope, 23 Oraven Street, Charing Cross, W.C.	
" 23	London, S.W.—Technical Institute	Architect's Department, 18 Pall Mall East, S.W.	
" 23	Ilford—School	O. J. Dawson, Architect, Bank Buildings, Ilford, Essex.	
" 23	West Bromwich—Schools	A. Long, 21 New Street, West Bromwich.	
" 23	Horsforth—Church Aisle, &c.	J. B. Fraser, 8 Park Square, Leeds.	
" 23	Edinburgh—Alterations &c., to Schools	Mr. Carfrae, 3 Queen Street, Edinburgh.	
" 23	Badshot Lea, near Aldershot—Church	O. H. M. Mileham, Architect, Badshot House, Badshot, Lea.	
" 24	Acton, W.—Public Baths	D. J. Ebbetts, 242 High Street, Acton, W.	
" 25	Tresawle, Cornwall—Stable and Wain house	H. S. Mitchell, Farmhouse, Tresawle, Probus.	
" 28	Manchester—Portland Cement, Lime, &c.	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.	
" 30	Bedwas, Mon.—Additions, &c., to School	J. H. Phillips, Architect, Olive Chambers, Windsor Place, Cardiff.	
" 30	Cairo—Bookcase, Cupboards, &c., at Museum	Chief of Administrative Service, Cairo.	
" 30	Hornchurch—Extension, &c., of Church	F. W. Thompson, Berther Road, Hornchurch.	
July 5	Glasgow—College Buildings	H. F. Stockdale, 38 Bath Street, Glasgow.	
" 16	Carshalton, Surrey—Convalescent Hospital	Treadwell & Martin, 2 Waterloo Place, Pall Mall, S.W.	
No date	Bush Hill Park, Enfield—Three Houses and Five Shops	Crickmay & Sons, 13 Victoria Street, Westminster, S.W.	
"	Plymouth—Concrete Foundation for Memorial	F. W. Marks, 3 Staple Inn, W.C.	
ENGINEERING:			
June 12	Burnham, Somerset—Sewer, Road, &c.	Corporation	W. J. Press, Engineer, Town Hall, Burnham.
" 12	Harrogate—Light Railway	Bengal-Nagpur Rly. Co., Ltd.	E. W. D.xon, 14 Albert Street, Harrogate.
" 13	London, E.C.—Machines, Material, Wagons, Hnd. Cranes	Renfrew District Committees	Company's Office, 132 Gresham House, Old Broad Street, E.C.
" 13	Greenock—Addition to Bridge	Tramways Committee	R. Drummond, 2 Lyleland Terrace, Paisley.
" 14	Manchester—Electric Tram Trolley Wire, &c.	Corporation	J. M. M'Elroy, 55 Piccadilly, Manchester.
" 14	Rotherham—Electrical Sundries	Guardians	H. H. Copnall, Town Clerk, Town Hall, Rotherham.
" 14	Birr, Ireland—Gas Engine, &c.	Guardians	H. Dooley, Clerk, Board Room, Workhouse Birr.
" 14	Hilla Green, near Scarborough—Rebuilding Iron and Steel Bridge	Urban District Council	W. G. Bryning, County Surveyor, Northallerton.
" 14	Abertillery—Reservoir	Startford Rural District Council	T. Rees, Corn Exchange Chambers, Newport, Mon.
" 14	Boldron, near Barnard Castle—Waterworks	Urban District Council	J. E. Parker, Engineer, Post Office Chambers, Newcastle-on-Tyne.
" 14	Hilla Green, near Scarborough—Rebuilding Iron and Steel Bridge	Urban District Council	W. G. Bryning, County Surveyor, Northallerton.
" 15	Brownies Tang, Zetland—Pier, Hauling Slip and Access Road	Corporation	G. R. & W. Jamieson, Jeffrey Street, Edinburgh.
" 16	Ashton-under-Lyne—Machinery	Corporation	J. T. Earnshaw, Borough Engineer, Town Hall, Ashton.
" 16	Newport, Mon.—Transporter Bridge	Corporation	Borough Engineer, Town Hall, Newport.
" 16	Kilsyth—Laying two miles of Water-pipes	Town Council	Kyle & Frew, 149 West George Street, Glasgow.
" 17	Newton Abbot, Devon—Sluice Valves, &c.	Rural District Council	W. Fox & R. A. Tatton, 5 Victoria Street, Westminster.
" 17	Newton Abbot, Devon—Waterworks	Rural District Council	W. Fox & R. A. Tatton, 5 Victoria Street, Westminster.
" 17	London, E.C.—Roofing (5 Spans, 100ft. by 25ft.)	South Indian Rly. Co., Ltd.	Company's Office, 55 Gracechurch Street, E.C.
" 17	Hoddesdon, Herts—Gas Lighting Lamps in District	Urban District Council	P. R. Longmore, Clerk, High Street, Hoddesdon.
" 17	St. Annes-on-Sea—Fire Alarms	Urban District Council	T. Bradley, Clerk, Council Offices, Sch. Drive, St. Annes-on-the-Sea.
" 17	Rotherham—Electrical Plant	County Council	Kennedy & Jenkin, 17 Victoria Street, Westminster.
" 18	Hadnam Mill, Herts—Reconstructing Bridge	Urban District Council	U. A. Smith, 41 Parliament Street, S.W.
" 18	Stretford, Manchester—Electrical Plant	Corporation	C. H. Worthingham, 19 Brazenose Street, Manchester.
" 18	Warrington—Electric Tramcars	Corporation	Preese & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
" 19	New Brighton, Cheshire—Reservoir, &c.	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
June 19	Alexandria, Egypt—Swing Bridge over Canal ..	Urban District Council ..	Inspector of Irrigation, 3rd Circle, Alexandria.
" 20	Little Woolton, Liverpool—Electric Lighting ..	Rural District Council ..	R. Simmons, Surveyor, Grange Lane, Gateacre, near Liverpool.
" 20	Chelmsford—Pump ..	Town Council ..	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
" 21	Dundee—Steel Girder Bridge ..	Rural District Council ..	W. Mackison, 91 Commercial Street, Dundee.
" 21	Lisnaskea, Ireland—Wood Supply ..	Rural District Council ..	J. O'R. Hoey, Clerk, Council Office, Lisnaskea.
" 21	Kirkcaldy—Electric Wiring Central Station ..	Corporation ..	Kennedy & Jenkin, 17 Victoria Street, Westminster.
" 24	Bury, Lancs.—Tramways ..	Tramways Committee ..	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.
" 24	Southall, Middlesex—Alterations, &c., to Sewage Disposal Works ..	Urban District Council ..	R. Brown, Engineer, Public Offices, Southall.
" 30	Sydney, N.S.W.—Bridge across Harbour ..	Corporation ..	Under-Secretary for Public Works, Sydney.
" 30	Pwllheli, Carnarvonshire—Harbour Works ..	War Office ..	W. T. Douglass, 15 Victoria Street, Westminster, S.W.
July 31	London, S.W.—Self-propelled Lorry ..	War Office ..	Director of Army Contracts, War Office, Pall Mall, S.W.
" 31	Army Contracts—Self-propelled Lorry ..	War Office ..	Director of Army Contracts, War Office, Pall Mall, S.W.
Sept. 1	Valparaiso, Chile—Electric Tramways ..	Mayor and Aldermen ..	Chilian Consulate, 10 Lime Street, E.C.
" 15	Launceston, Tasmania—Electric Power Transmission Extensions.		J. Terry & Co., 7 Great Winchester Street, E.C.
IRON AND STEEL:			
June 12	Cornsay Colliery, Durham—Iron Castings, &c. ..	Town Council ..	Ferens & Lowe, Market Place, Durham.
" 12	Edinburgh—Iron Fencing, &c., in Park ..		R. Morham, City Architect, City Chambers, Edinburgh.
" 14	Hilla Green, near Scarborough—Iron and Steel Work for Bridge Rebuilding.		County Surveyor, Northallerton.
" 14	Manchester—Cast-iron Car Wheels ..	Tramways Committee ..	J. M. McElroy, 55 Piccadilly, Manchester.
" 14	Manchester—Trolley Wire, &c. ..	Tramways Committee ..	J. M. McElroy, 55 Piccadilly, Manchester.
" 16	Heywood—Stores ..	Water Board ..	J. Diggle, Water Engineer, Board Offices, Heywood.
" 17	Croydon—Cast-iron Pipes ..	Lunacy Visiting Committee ..	Borough Engineer, Town Hall, Croydon.
" 17	Newton Abbot, Devon—Cast-iron Pipes ..	Rural District Council ..	W. Fox & R. A. Tatton, 5 Victoria Street, Westminster.
" 17	Salford—Tramrails, &c. ..	Tramways Committee ..	General Manager, Tramways Department, Town Hall, Salford.
" 17	London, E.C.—Hardware, Iron, Steel, &c. ..	South-Eastern Railway Co., Ltd. ..	Company's Offices, 55 Gracechurch Street, E.C.
" 19	Pentre, Glamorgan—Cast-iron Pipes ..	Rhondda Urban District Council ..	O. Thomas, Gas and Water Offices, Pentre, R.S.O., Glamorgan.
" 24	Bury, Lancs.—Rails, &c. ..	Tramways Committee ..	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.
" 25	Manchester—Iron Castings, &c. ..	Gas Committee ..	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
PAINTING AND PLUMBING:			
June 12	Rockdale—Painting Cemetery Seats and Railings ..	Cemetery, &c., Committee ..	S. S. Platt, Borough Surveyor, Town Hall, Rockdale.
" 16	Heywood—Oil, Lead Pipes, &c. ..	Water Board ..	J. Diggle, Water Engineer, Board Offices, Heywood.
" 16	Cwmaman—Painting and Renovating Chapel, &c. ..		G. Thomas, 12 Ffrenchman Road, Cwmaman.
" 17	London E.C.—Oils and Colours ..	South Indian Railway Co., Ltd. ..	Company's Offices, 55 Gracechurch Street, E.C.
" 23	Edinburgh—Painting at Schools ..	School Board ..	Mr. Carfrae, 3 Queen Street, Edinburgh.
" 25	Manchester—Brushes, Paints, &c. ..	Gas Committee ..	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
July 1	Yardley, Birmingham—Cleaning, Painting, &c., Schools	School Board ..	A. Harrison, 109 Colmore Road, Birmingham.
ROADS AND CARTAGE:			
June 12	Uxbridge—Roadworks ..	Rural District Council ..	J. F. Stow, Surveyor, Corn Exchange, Uxbridge.
" 12	Burnham, Somerset—Roads, Footpaths, &c. ..	Hackney Borough Council ..	W. J. Press, Surveyor, Town Hall, Burnham.
" 12	London, N.E.—Woodpaving ..	Corporation ..	N. Scorgie, Borough Surveyor, Town Hall, Hackney, N.E.
" 13	Preston—Paving, Flagging, &c. ..	Rural District Council ..	Borough Surveyor, Town Hall, Preston.
" 14	Westhampton, Sussex—Flints ..	Rural District Council ..	W. P. Cogan, Clerk, North Pallant, Chichester.
" 14	Uckfield, Sussex—Hire of Road Rollers ..	Rural District Council ..	F. Holman, Clerk, High Street, Lewes.
" 16	London, N.—Road Works ..	Hornsey Urban District Council ..	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate.
" 16	Reigate—Street Improvements ..	Town Council ..	F. T. Clayton, Borough Surveyor, Reigate.
" 16	Saffron Walden, Essex—Tar-paving, &c. ..	Town Council ..	A. H. Forbes, Borough Surveyor, Saffron Walden.
" 16	Eastbourne—Improvement Works ..	Corporation ..	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
" 17	Pontyrryl, Bridgend, Glam.—Asphalting Playground	Bettws School Board ..	D. Edmonds, Clerk, Chapel Bach, Llangonoyd, near Bridgend.
" 17	Horsham—Materials ..	Tramways Committee ..	General Manager, Tramways Department, Town Hall, Salford.
" 17	East Grinstead—Road Materials and Steam-rolling ..	Urban District Council ..	S. Mitchell, Clerk, Council Offices, Horsham.
" 18	London, S.W.—Making-up and Paving Streets ..	Urban District Council ..	R. Wilds, Surveyor, Urban Council Offices, East Grinstead.
" 19	London, W.—Making-up Roads ..	Fulham Borough Council ..	F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.
" 19	London, N.W.—Wood and Sanitary Block-paving ..	Ealing Town Council ..	O. Jones, Borough Engineer, Town Hall, Ealing, W.
" 24	West Ham, E.—Making-up Streets ..	Hampstead Borough Council ..	O. E. Winter, Borough Engineer, Town Hall, Haverstock Hill, N.W.
		Borough Council ..	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
SANITARY:			
June 12	Chartham, Kent—Scavenging ..	Bridge Rural District Council ..	T. L. Collard, Clerk, Bridge, Canterbury.
" 12	Burnham, Somerset—Sewer, &c. ..		W. J. Fess, Surveyor, Town Hall, Burnham.
" 13	Manchester—Urinal Stalls ..	Sanitary Committee ..	City Surveyor, Town Hall, Manchester.
" 14	Haywood, Scotland—Drain ..	Gas Coal Company ..	Johnstone & Rankine, 238 West George Street, Glasgow.
" 17	Hamilton, Scotland—Drainage Works ..	District Committee ..	W. L. Douglas, District Engineer, District Offices, Hamilton.
" 16	Newmarket—Breeze for Bacteria Beds ..	Urban District Council ..	S. J. Ennion, Clerk, Deva Chambers, High Street, Newmarket.
" 16	London, N.—Sewer Works ..	Hornsey Urban District Council ..	E. J. Lovegrove, Council's Engineer, Southwood Lane, Highgate, N.
" 16	Blackburn—Reconstructing Privies, &c. ..	Health Committee ..	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
" 16	Horsham, Sussex—Sewer, &c. ..	Rural District Council ..	M. Brooks, St. Leonard's Road, Horsham.
" 18	Dartford—Drain ..	Urban District Council ..	W. Harston, Surveyor, Sessions House, Dartford.
" 19	Chester-le-Street—Sewage-disposal Works ..	Rural District Council ..	D. Balfour & Son, 3 St. Nicholas Buildings, Newcastle-on-Tyne.
" 20	Banff, Scotland—Drainage Works ..	District Committee ..	J. Graut, 23 Castle Street, Banff.
" 21	Pontefract—Sewage Works ..	Town Council ..	B. Latham, Parliament Mansions, Victoria Street, Westminster.
" 25	Manchester—Lime, &c. ..	Gas Committee ..	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
July 7	South Stoneham—Sewerage Works ..	Rural District Council ..	Bailey-Denton, Son, Lawford & Symons, Palace Chmbs., Westminster.
TIMBER:			
June 12	Cornsay Colliery, Durham—Timber ..		Ferens & Love, Market Place, Durham.
" 16	Heywood—Timber ..	Water Board ..	J. Diggle, Water Engineer, Water Board Offices, Heywood.
" 17	Salford—Wood Blocks for Paving ..	Tramways Committee ..	General Manager, Tramways Department, Town Hall, Salford.
" 25	Manchester—Timber ..	Gas Committee ..	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June 12	Crewe—Municipal Office and Council-Chamber ..	£50, £25.	Borough Surveyor, Municipal Offices, Crewe.
" 16	Hartshill, Stoke-on-Trent Nurses Home ..	—	A. E. Boyce, Secretary, North Staffs Infirmary and Eye Hospital, Hartshill.
" 17	Clonmel—Ten Labourers' and Two Artizans' Dwellings ..	—	J. F. O'Brien, Town Clerk, Corporation Offices, Clonmel.
" 27	West Hartlepool—School ..	£75, £35.	J. R. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings ..	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices ..	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River ..	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
" 15	Liverpool—Labourers' Dwellings ..	£250, £150, £100.	Town Clerk, Liverpool.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c. ..	£200, £100, £50.	W. H. Prescott, Engineer, U.D.O. Offices, Tottenham.
Nov. 1	Allahabad—Memorial to Queen Victoria ..	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.
No date.	Rogerstone—Isolation Hospital ..	—	J. Thomas, Clerk to Saint Mellons R.D.O., Queen's Hill, Newport, Mon.

Trade and Craft.

A Coronation Panel.

The influence of the Coronation is wide-spread, and we see in all directions special-made goods of every description. Builders and architects have not been neglected in this, for a coronation panel in buff or red terra-cotta has been prepared for them by Mr. Walwyn T. Chapman, of Cleethorpes. From the illustration given in another part of this issue it will be seen that the design is a very pleasing one, his Majesty's head being well and suitably modelled, while set around the medallion at the corners are the emblems of our greater colonies, the whole intertwined by a floral design in relief. Below this is a shield with the royal initials in the midst of the national flowers, while above, and set in a rounded pediment, a lion of valiant mien looks out on all. It is usual for terra-cotta makers to be always reviving the Italian Renaissance in their ornament: Mr. Chapman has adopted a plain floral treatment, leaving cherubs and strange animals to their own devices.

Some New Designs for Door Furniture.

The design of fittings for doors is really governed by many practical conditions which, more often than not, are quite overlooked. Prominent among these is the question of subsequent cleaning. Take bell-pushes, for example. The design of any bell-push is, or should be, entirely dependant on whether it is intended to be left as it leaves the workshop, allowing the weather to produce such effect as it will, or to be periodically cleaned and polished bright—if the former, perforations and incisions may be made as fancy directs; but if the latter, then the practical effect of cleaning demands a plainly-treated surface and the absence of any places where the polishing paste can lodge. This is very obvious, but in nine cases out of ten it is entirely disregarded, with the result that fittings which look well enough when new have, under the cleaner's hand, become pieces of dirt-filled metalwork. It is gratifying to know, however, that the modern tendency is towards a plain treatment. There are several examples of this in the new catalogue issued by Messrs. White & Sons (late Gibbons & White), of 207, Oxford Street, W. The designs have been prepared and executed with care, and many of them are very satisfactory. Architects should send for a copy of this interesting little catalogue.

CURRENT MARKET PRICES.

FORAGE.		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	—
Clover, best ..	per load	4 15 0	5 10 0
Hay, best	do.	5 5 0	5 12 6
Sainfoin mixture ..	do.	4 10 0	5 5 0
Straw	do.	1 10 0	2 4 0

OILS AND PAINTS.		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 5 1	1 6 0
Colza Oil, English ..	do.	1 7 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 12 0	2 12 6
Lead, white, ground, carbonate do.	do.	1 4 10	—
Do. red	do.	1 0 4 1/2	—
Linseed Oil, barrels ..	do.	1 11 1 1/2	—

Petroleum, American ..		per gal.	£ s. d.	£ s. d.
Do. Russian	do.	0 0 6 1/2	0 0 6 1/2	—
Pitch	per barrel	0 7 0	—	—
Shellac, orange	per cwt.	5 12 0	—	—
Soda, crystals	per ton	3 2 6	3 5 0	—
Tallow, Home Melt ..	per cwt.	1 12 0	1 13 0	—
Tar, Stockholm	per barrel	1 2 6	—	—
Turpentine	per cwt.	1 16 0	—	—

METALS.

Copper, sheet, strong ..	per ton	69 0 0	—	—
Iron, Staffs, bar	do.	6 7 6	8 0 0	—
Do. Galvanised Corrugated sheet ..	do.	11 15 0	11 17 6	—
Lead, pig, Soft Foreign ..	do.	11 7 6	—	—
Do. do. English common brands	do.	11 10 0	—	—
Do. sheet, English 3lb per sq. ft. and upwards ..	do.	13 5 0	—	—
Do. pipe	do.	13 15 0	—	—
Nails, out clasp, 3in. to 6in. ..	do.	9 5 0	—	—
Do. floor brads	do.	9 0 0	—	—
Steel, Staffs, Girders and Angles	do.	5 15 0	6 5 0	—
Do. do. Mild bars	do.	6 10 0	7 0 0	—
Tin, Foreign	do.	133 0 0	133 10 0	—
Do. English ingots	do.	133 0 0	131 10 0	—
Zinc, sheets, Silesian	do.	21 0 0	—	—
Do. do. Vieille Montaigne ..	do.	21 10 0	—	—
Do. Spelter	do.	18 11 3	18 15 0	—

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel ..	per load	3 0 0	4 10 0	—
Pine, Quebec, Yellow ..	per load	4 7 6	6 0 0	—
Do. Pitch	do.	2 14 0	3 12 0	—
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0	—
Do. Petersburg ..	per bundle	0 8	—	—
Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0	—	—
Do. do. 4th & 3rd ..	do.	8 10 0	15 15 0	—
Do. do. unsorted ..	do.	6 12 6	6 10 0	—
Do. Riga	do.	6 15 0	12 10 0	—
Do. Petersburg 1st Yellow ..	do.	16 0 0	—	—
Do. do. 2nd	do.	9 0 0	12 10 0	—
Do. do. White	do.	7 5 0	12 10 0	—
Do. Swedish	do.	7 15 0	12 15 0	—
Do. White Sea	do.	13 5 0	17 5 0	—
Do. Quebec Pine, 1st ..	do.	11 10 0	24 10 0	—
Do. do. 2nd	do.	22 5 0	—	—

TENDERS.

In'ormation from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABERDEEN.—Accepted for the erection of a new poorhouse at Oldmill, for the Aberdeen Parish Council:—
Pringle & Slessor, Thistle Lane, masons ... £10,320
Leslie & Hay, Fraser Road, carpenters ... 16,900
J. Bannochie & Sons, Belmont Street, masons ... 9,085
John Dean, Queen Street, plumber ... 6,840
John Grant, Gilcomston Steps, ironwork ... 2,777
J. & S. Fyfe, Dee Street, painters and glaziers ... 2,060

AXBRIDGE (SOMERSET).—For the erection of a new infirmary (about 60 beds) on a site adjoining the existing workhouse, for the Axbridge Board of Guardians. Mr. A. Powell, A.M.I.C.E., engineer, 3 Unity Street, College Green, Bristol:—
Stephens, Bastow & Co., Montpelier, Bristol ... £8,997 0
A. Wills & Sons, Spring Gardens, Bath ... 6,970 0
R. H. B. Neal, Princess Square, Plymouth ... 6,830 0
A. J. Bevan, Bedminster, Bristol ... 6,300 0
Pollard, Bridgewater ... 6,200 0
Walters, St. Andrew's Road, Montpelier, Bristol ... 6,200 0
J. Ford & Sons, Cheddar ... 6,045 15
C. Addicott, Locking Road, Weston-super-Mare ... 5,720 0
C. Bryer, Bridgewater ... 5,080 0
A. G. Colborne, Newport Street, Swindon ... 5,568 8
G. Sprake, Milton, near Weston-super-Mare ... 5,523 0
* Accepted.

BEKLEY (KENT).—For the erection of farm buildings, farmhouse, and lodge at Woollet Hall, Bekley, for Mr. Ronald Keep. Mr. Ernest H. Abbott, architect, 6 Warwick Court, Gray's Inn, W.C. Quantities by Mr. A. Johnson, 34 Imperial Buildings, Ludgate Circus, E.C.:

Farm Buildings.		£1,400 0 0	1,336 19 8	1,218 12 3
Stebbing & Pannett ..	...	...	...	...
H. Dunn .. ..	...	...	...	...
W. H. Smith .. ..	...	...	...	...
Farmhouse.		997 0 0	975 0 0	933 0 0
F. P. Duthoit .. ..	...	...	...	...
W. G. Brown .. ..	...	...	...	...
J. Lonsdale .. ..	...	...	...	...
R. & E. Evans .. ..	...	...	...	...
H. Dunn .. ..	...	...	...	...
W. H. Smith .. ..	...	...	...	...
S. Salt .. ..	...	...	...	...
Ellingham & Sons ..	...	...	...	...
Stebbing & Pannett
Lodge.		597 0 0	526 0 0	495 0 0
F. P. Duthoit
R. & E. Evans
W. G. Brown
J. Lonsdale
S. Salt

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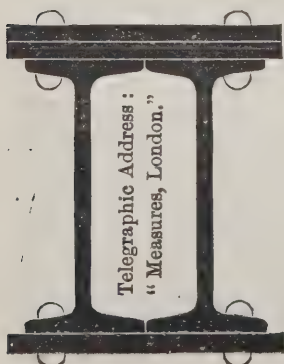
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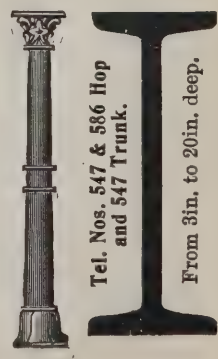
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Ellingham & Sons ..	457 13 0
H. Dunn	453 19 0
Stebbing & Pannett ..	490 0 0

BRADFORD.—Accepted for the erection of Bradford Eastbrook Mission Hall. Messrs. W. J. Morley, F.R.I.B.A. & Son, architects:—
 Mason ... J. Brown & Son, Bingley.
 Joiner ... Greenhough & Murgatroyd, Keighley.
 Plumber ... G. Thompson, Leeds.
 Plasterer ... Thos. Bolton, Bradford.
 Painter ... F. Holdsworth, Shipley.
 Slater ... Hill & Nelson, Bradford.
 Concretor ... (Not decided.)
 Ironfounder ... E. & W. H. Haley, Bradford.

BRENTWOOD.—For the erection of house and stabling, Hutton, for Mrs. Farnes. Mr. J. Walter Wyles, architect, St. Stephen's Chambers, Telegraph Street, E.C.:—
 J. Bruty £2,532 0 0
 Hammond & Son 2,481 0 0
 W. J. Watts 2,278 0 0
 Smith & Son 2,200 0 0
 G. Abbott 2,184 0 0
 A. & J. Cross 2,003 5 10
 * Accepted.

BRIGHTON.—For the erection of a boundary wall and extensions to the Corporation tramways car-sheds, Lewes Road, Brighton:—
 Sattin & Evershed, Brighton £5,489
 W. A. Field & Co., Brighton 5,211
 J. Longley & Co., Crawley* 4,849
 * Recommended for acceptance.

CARLOW.—For the erection of 27 labourers' cottages in three contracts, in the town of Carlow, for the Carlow Urban District Council:—
 P. J. Hussey, Dundrum, co. Dublin £5,082 0 0
 T. Somers & Son, Crumlin, co. Dublin 5,803 0 0
 J. W. Mitchell,* Carlow 5,374 15 8
 M. Hickey,† Carlow 3,492 5 0
 * Accepted, exclusive of main sewer work.
 † For 11 cottages only, No. 1 contract.

COWES (ISLE OF WIGHT).—For the erection of a residence, Baring Road, Cowes, for Miss Sophia Groves, Mr. Philip Sturdy, architect, Bournemouth:—
 H. E. Day £2,405 | Bradine & Son £2,200
 Brown & Sons 2,419 | J. Nichol,* Southampton 1,790
 Ball & Son 2,381 | * Accepted.

CROYDON.—For the erection of winter gardens and conservatory at 79 Coombe Road, Croydon, for Mr. A. Dyer, Mr. M. S. Reilly, architect, Eldridge Road, Croydon. Quantities by Mr. J. Keenard, 104 George Street, Croydon:—
 J. Westbrook, Thornton Heath £1,470
 Underwood & Co. 1,412
 W. Potter 1,400
 D. W. Barker 1,370
 Hanscombe & Smith 1,344
 Funnell & Co. 1,329
 Worfold & Sons, Addiscombe 1,320
 Akers & Co., South Norwood 1,233
 Huntley Bros. 1,231
 [Rest of Croydon.]

DEVONPORT.—For supply of all materials in connection with, and the execution complete of, the following works, for the Corporation: (Contract A) permanent way, road bed, paving, and bonding of 3 miles 1 furlong 2' 08 chains of double tramway track, and all incidental and special works:—

W. Winnard	£40,146 11 0
Pethick Bros.	44,952 10 8
C. L. Duke	43,224 6 8
Mayoh & Haley	43,115 7 4
Harrod & Co.	42,553 14 11
Macartney, McElroy & Co.	41,745 18 10
J. and T. Binns	41,117 6 3
A. N. Coles	39,515 8 4
J. C. Lang	39,378 13 6
W. Griffiths & Co., Ltd.,* Bishopsgate Street Without, London, E.C.	38,157 7 1
Matcham & Co.	37,287 0 0
W. C. Shaddock	35,127 15 1
* Accepted.	

FARNBOROUGH (KENT).—For the erection of a pair of semi-detached houses. Mr. Money Marsland, architect, 61 Great Tower Street, E.C.:—
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 Smith & Sons 1,569
 W. Owen* 1,190
 * Accepted.

GREAT BADDOW (ESSEX).—Accepted for additions to Carlton Lodge, Great Baddow, Essex. Mr. R. Mawhood, architect, Chelmsford:—
 J. Gowers, Chelmsford £595

HOVE.—For the erection of flats and shops, Church Road, and Osborne Street, Hove. Mr. A. W. Nye, architect, 31 Duke Street, Brighton:—
 Brown & Sons £6,548 | W. A. Field & Co. £6,200
 Sattin & Evershed 6,487 | Parsons & Sons 6,120
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J. Moran, Sheffield	5,011 0 0
J. Hadfield & Sons, Sheffield	4,935 0 0
G. Hall, Sheffield	4,372 0 0
J. Hague, Hoyland	3,010 0 0
[Surveyor's estimate, £3,988.]	

Contract No. 2.	
M. Grantham	218 10 0
Asphaltic Limestone Company, Birmingham	205 11 5
J. Moran	192 6 0
North of England Asphalt Company, Manchester	183 10 0
G. Haughton, Retford	177 0 2
W. E. Constable & Co., Ltd., Matlock	
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J. Hadfield & Sons	165 17 0
G. Hall	148 4 0
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ILKESTON.—For the erection of co-operative stores, Park Road, Ilkeston, for the Ilkeston Co-operative Society. Messrs. George Haslam, M.S.A., & Son, architects, Ilkeston:—

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Alf. Earnshaw	533 9 8
David Roberts	510 0 0

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Donnelly & Sons, Kimberley	7,600
W. V. Ineson, East Street, Ilkeston	7,500
Moss & Sons, Loughborough	6,950

* Accepted.

IN GATESTONE (ESSEX).—For the erection of villas at Ingatestone, Essex. Mr. R. Mawhood, architect, Chelmsford:—

P. Green, Ingatestone	£725
C. Jennings, Margretinge	740
J. Gowers, Chelmsford	695

* Accepted.

LEISTON (SUFFOLK).—For alterations and additions to premises at Leiston, Suffolk, for the Leiston Industrial Co-operative Society, Ltd. Mr. Henry J. Wright, architect, 4 Museum Street, Ipswich:—

F. C. Thurman, Walton	£1,555 0
Gibbs & Son, Leiston	1,493 10

* Accepted.

TORQUAY.—For the erection of warehouse and workshops in Swan Street, for the Torquay Gas Company. Quantities by Mr. C. Sewell Appleton:—

T. Smerdon	£1,179 0
Bovey & Son	1,090 0
S. Pack	1,069 0
J. C. & W. Watson	1,026 0
E. Pike	1,025 6
R. F. Yeo & Sons	975 0

* Accepted. [All of Torquay.]

UXBRIDGE.—For the erection of new Sunday Schools, and other buildings, for the Trustees of the Providence Congregational Church, Uxbridge. Messrs. Heron & Bellairs and Wm. L. Eves, A.R.I.B.A., joint architects, 54 High Street, Uxbridge:—

C. F. Kearley, Uxbridge	£3,542 0
Hunt & Son, High Wycombe, Bucks	3,205 0
W. Buttrum, Hillingdon, near Uxbridge	3,180 0
J. Ward & Sons, Uxbridge	2,735 10

* Accepted.

WATFORD.—For the erection of children's homes in Ashby Road, Leavesden Road, Watford, for the Guardians:—

S. Swann	£2,258 18
G. J. Waterman	2,244 0
Rees	2,140 0
G. A. Judge	2,100 0
Clark Bros.	2,075 0
Clifford & Gough	2,069 0
W. King	2,050 0
Tyler & White	2,000 0
R. L. Tonge	1,988 0
W. Wiggs	1,960 0
H. B. Watkins	1,949 0
C. Brightman, Queen's Road	1,928 0

* Accepted. [All of Watford.]

WALTHAMSTOW.—For additions, &c., to boys' and girls' departments, Higham Hill Schools, for the School Board. Mr. H. Brosser, architect. Quantities by Mr. G. T. G. Wright, 3 Great Winchester Street, E.C.:—

S. Farmer, Brinsford	£3,883 0 0
J. & J. Dean, Walthamstow	3,473 0 0
B. E. Nightingale, Lambeth	3,350 0 0
Sands, Palmer & Co., Walthamstow	3,350 0 0
Chessum & Foss, Bow	3,329 0 0
R. E. Evans, Peckham	3,298 0 0
Viney & Stowe, Haverstock Hill	3,279 0 0
Poster Bros., Norwood	3,257 0 0
Hammond & Sen, Romford	3,105 0 0
Knight & Son, Tottenham	2,928 0 0
Dollard & Brand, Tottenham	2,730 0 0
Rowley Bros., Tottenham	2,635 7 2

WOKING.—For the erection of a detached house, York Road, for Mr. S. Gloster. Messrs. W. G. Jones & Clinton, architects, 3 Broadway, Woking:—

F. Aylott	£1,250 0
Harris & Son	1,174 0
A. A. Gale	1,153 0
Ingram & Son	1,125 0
G. Allard	1,125 0
W. Aird	1,115 18

* Accepted.

WOKING.—Accepted for the erection of a detached house, Heathside Park Estate, for E. A. Brine, Esq. Messrs. W. G. Jones, M.S.A., and Clinton, architects and surveyors, 3 Broadway, Woking:—

J. Harris & Son	£1,268
-----------------	--------

WREXHAM.—For the erection of a drill hall for the 1st V.B. R.W.F. Mr. M. J. Gummow, A.R.I.B.A., architect, Egerton Street, Wrexham:—

H. A. Jones, Poplar Road	£3,350 10 6
J. Hughes, Bersham Road	3,288 0 0
Lewis Bros., Smithfield Road	3,259 0 0
P. Edwards, Dostleton, Chester	3,250 0 0
W. E. Samuels, Market Street	3,200 0 0
Davies Bros., 3, 4, and 5 Hill Street	3,118 10 0

* Accepted. [Rest of Wrexham.]

A New Church at Dairycoates, Hull, is being erected in Romanesque style, the nave arcading having semicircular arches supported on circular stone piers with moulded bases and carved caps. The architects are Messrs. Broderick, Lowther & Walker, of Hull and Bridlington.

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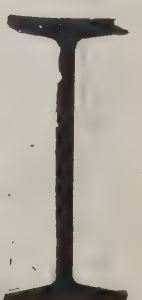
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An Architectural Causerie.

Holborn-Strand Designs: The Report at Last.

AFTER having been kept secret for a year and a half, the report of Mr. Norman Shaw and Mr. Riley on the Holborn-Strand designs is now made public. It is printed on p. 281 of this issue. The difficulty of an assessor in such a competition as this must necessarily be very great, as architects of note do not care to criticise one another's work publicly; and we must assume that Mr. Shaw was able to shrewdly guess who were the authors of the several designs—we ourselves were able to do so with absolute accuracy. The report, however, is very decided in its criticism. As we remarked at the time of the exhibition of the designs, No. 26 (by Mr. Hare, placed first) was generally admitted to be the most satisfactory exposition of the problem. Of No. 27 (by Mr. Flockhart, placed second) we must repeat our former criticism—"Looked at in part, there is much to interest; but we hope to be spared a go-ahead chateau in the Strand." As to the design placed third (No. 20, by Mr. Macartney) we may also repeat our opinion that "the author submitted a fine monumental design some years ago for the South Kensington Museum, but that level has not been reached in the interesting collection here exhibited." The report of Mr. Shaw and Mr. Riley, it will be noticed, specially insists that a definite style—English Renaissance of the best period—should have been indicated. If that had been done, we might possibly have secured better results, but, with the exception of Mr. Flockhart, all the competitors followed English Renaissance models. This report comes very late in the day; it should have been published long ago; and, bringing the competition once more to notice at a time when Mr. Runtz's buildings at the western end of the "island" site are being rapidly erected, it only emphasizes the fact that the whole scheme was a fiasco, resulting in nothing more than eight architects receiving £250 each for their trouble, and one of them, whose work is not mentioned by the assessors, carrying out part of a scheme very different from that submitted in the competition.

Competition Reform Society.

A SOCIETY has been organised to reform the methods of conducting architectural competitions, to further which object it requires representation on the Council of the Royal Institute of British Architects by members in sympathy with the aims of the society, and the co-operation of architects practising in the provinces. The committee consists of Messrs.

A. W. S. Cross (chairman), H. V. Lanchester (vice-chairman), A. Cox, J. S. Gibson, S. B. Russell, H. A. Saul and E. W. Wimperia, with Mr. H. W. Wills (4, Adam Street, Adelphi) as hon. secretary and Mr. C. E. Hutchinson (11, John Street, Bedford Row) as assistant hon. secretary. The annual subscription is 5s. By the action it has taken in regard to the conduct of architectural competitions during recent years, the Institute has certainly effected much good: but there are cases where an outside society might also act with advantage; and it is partly for this purpose that we presume the Competition Reform Society has been created. There is much improvement still needed. Committees of laymen, very few of whom possess any architectural qualification, seem very prone to disregard the opinions of assessors, or to

between 1525 and 1535. Though not equal to the best work of Luca and Andrea, the frieze is very fine in conception and modelling, and extremely rich in its general decorative effect.

Architectural Detail Postal Club.

THIS is the title of a new club of which Mr. W. Marriott Dodson, Bettws-y-Coed, North Wales, is the honorary secretary. Following the practice of postal club a portfolio of photographs is circulated monthly among the members, each of whom can contribute one, two or three prints. The object is to secure permanent photographs of architectural details—miserere carvings, bench ends, gargoyles, &c.—and to compile in the Club Note-book a list of those who possess the negatives, it being intended, if funds permit, to print this list at



DELLA ROBBIWA WARE, HOSPITAL "DEL CEPPO," PISTOJA, ITALY.

impose conditions which are quite unfair to competing architects and damaging to the profession as a whole.

A Della Robbia Frieze.

PISTOJA, or Pistoia, is a city 21 miles north-west of Florence. The special manufacture of the place is now fire-arms ("pistol" derives its name from here), but in the Middle Ages it played a leading part in the development of architecture and sculpture. The Hospital "del Ceppo" was originally built in the thirteenth century, but was remodelled in the fifteenth. It is notable for the reliefs in enamelled and coloured terra-cotta with which its exterior is decorated, especially for the frieze of figures in high relief over its open arcade, shown by the accompanying illustration. The frieze consists of a series of groups representing the Seven Works of Mercy and other figures, executed by the younger members of the Della Robbia family

the end of each year, and to ask all members to forward copies to the local architects, wood-carvers and designers; in addition to which copies will be posted to all architectural magazines and papers, to archaeological societies and to publishers. Members are required to pay an annual subscription of half-a-crown, and though all copying of others' work is inadmissible, they are entitled to purchase platinotype prints at low rates. The employment of the camera as a means of securing accurate records of architecture is receiving increasing attention, and there can be no doubt that it may often advantageously take the place of sketching, more especially when visits have to be short and hurried. We should like to see more architectural students making use of the camera in an intelligent manner, and we are sure that many who already do so will be glad to know of the club to which a brief reference has been made above.

WESTMINSTER CATHEDRAL.

Cardinal Vaughan and the late J. F. Bentley.

CARDINAL VAUGHAN, in the "Westminster Cathedral Record" for June 7th, gives some interesting particulars in reference to the late J. F. Bentley and his great design. His Eminence says:—

For myself, I have a gratification in the thought that I gave him a free hand. Having laid down certain conditions as to size, space, chapels and style, I left the rest to him. He offered me the choice between a vaulted roof and one of saucer dome: I chose the latter. He wished to build two campaniles: I said one would be enough for me. For the rest he had a free hand. A metropolitan cathedral is not as a mission or a parish church—and the economics and limitations which I think ought, in a missionary country with small resources, to prevail as a rule in our ordinary buildings, would defeat a great religious object were they enforced upon the architect of a cathedral.

Mr. Bentley went to Italy to study the Roman and Byzantine styles. Rome, Palermo, Ravenna, Milan, Venice and Santa Sophia furnished him with object-lessons. What he saw and took in he steadily digested: and then, after a mental process that went on quietly and silently for months, he poured out rapidly on paper his matured conception of a Byzantine cathedral, and presented his plans, complete in all their wondrous lines and details, exactly as they have been carried out.

Mr. Bentley was a poet; he saw and felt the beauty, the fancy, the harmony and meaning of his artistic creations. He had no love of money, he cared little for economy; he had an immense love of art, a passion for truth and sincerity in his work. He was not ambitious to get on; he was not self-assertive—but he coveted to do well. He went in search of no work, but waited for the work to come in search of him. He was exquisitely gentle and considerate in dealing with suggestions and objections; but he would have his own way whenever it was a question of fidelity to his standard of artistic execution. I would not have singled him out to build cheap churches and schools. But he was the best of architects for a cathedral, or for any work that was to excel in artistic beauty. He was no mere copyist, and no slave to tradition. Whatever he produced was stamped with his own individuality; it was alive and original; and he

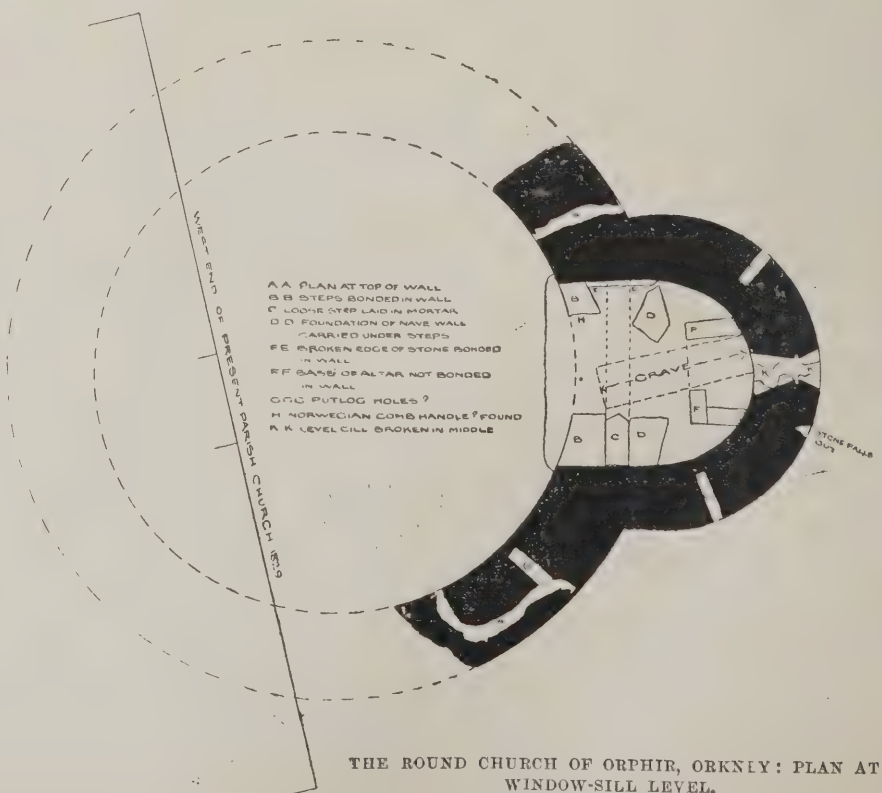


THE ROUND CHURCH OF ORPHIR, ORKNEY: VIEW OF APSE FROM THE SOUTH-EAST.

THE ROUND CHURCH OF ORPHIR, ORKNEY.

A paper on the Earl's House and Round Church of Orphir, Orkney, was read by Mr A. W. Johnston, F.S.A. Scot., before the annual general meeting of the Viking Club. The Round Church stands in the parish churchyard, which is situated on the lands of the Bú (Icelandic Bú—a homestead) of Orphir. In the immediate neighbourhood are the foundations of the Norse earl's Bú, to which (the Orkneyinga Saga states in 1136) a glorious church was attached. As the church is clearly one of those twelfth-century churches built in imitation of the church of the Holy Sepulchre at Jerusalem, there can be little doubt that it and the earl's glorious church, as mentioned in the Saga, are one and the same. Prior to the time the church is mentioned in the Saga, Earl Hakon was the only earl who had made a pilgrimage to Jerusalem, which he did a few winters after he murdered his cousin Earl and Saint Magnus, in 1116; he died c. 1123. It is, therefore, probable that he built the church on his return from his pilgrimage, to receive the relics which we are told he brought back with him. Only one-third of the eastern portion of the wall of the nave of the Round Church remains, in which is a semi-circular-headed archway, continued eastward as an apse, which projects half its width beyond the outer face of the nave wall. The first step at the entrance to the apse is circular, following the inner curve of the nave wall, and is built into the jambs of the archway. The second step goes straight across, but is not bonded into the wall. The base of the stone altar remains. The internal diameter of the nave is 19ft., and the apse 7ft. The small east window has splayed outer and inner jambs, with a groove for a window frame. The inner faces of the walls are plastered, which, from patches left, appears to have been the case outside as well. The wall has one footing outside, but none inside. There are no projecting eaves. The vault of the apse is covered outside with horizontal slabs of stone laid in mortar. The nave wall is 3ft. 6in. to 3ft. 9in. thick, and that of the apse 2ft. 8in. The walls have an outer and inner casing of random coursed masonry, the centre being filled with rubble concrete. The church was entire in 1756, when two-thirds were pulled down to repair the then parish church, which stood on the south side of the Round. The nave was described as vaulted, with a hole at the top, which with the east window were the only lights. The present parish church, of the usual barn type, was built in 1829, with its eastern end extending over the western half of the site of the round nave. As the ground is now 5ft. above the original level, the foundations of

the Round are undoubtedly preserved beneath the ground. It is now proposed to pull down the present parish church, and to build a new one further west, clear of the foundations of the round church, which can then be excavated and preserved as an ancient monument. The new church will be built of local stone and plastered outside and inside, the dressed stone being of local yellow freestone. The church has been designed (see centre plates) so that if one were to restore the Round in the mind's eye the vision of the old and new would not be incongruous. For this purpose, and as it best suits the very limited site, the axis of the new church radiates from the centre of the round nave, having a semicircular east end of the same external diameter as the Round. An appeal is about to be made for the necessary funds to carry out the scheme.



THE ROUND CHURCH OF ORPHIR, ORKNEY: PLAN AT WINDOW-SILL LEVEL.

had a genius for taking infinite pains with detail.

His reverence for God, for our Lord, His Blessed Mother and the Saints, pervaded everything he did for the Church. In his judgments on art and style there was a critical but a kindly humour; one always felt that there were an elevation and inspiration in his mind and character that were due to his religious instincts and to his unworldly standard of life. It seems to me that it will be necessary, for the perfection of the work Mr. Bentley has left behind him, to retain his mind as a guide to its completion, as far as we can know it. We know what happened to St. Peter's and to other buildings in which the plan and the genius of the original architect were departed from. Let us maintain the main idea and the unity of Bentley's work to the end.

The Baldachino.

The following additional particulars are also extracted from the official publication:—

In November, 1901, in discussing the design of the baldachino, as shown in the plan of the cathedral, Mr. Bentley wrote: "At present I see no other way of doing the baldachino than what I have shown, but I shall be glad of any suggestion. I know I spent a great deal of thought upon it, and I think *it is the best thing about the cathedral.*"

It was urged upon the architect that four columns would be lighter, better and cheaper than eight—that eight were not necessary—that four are commonly used wherever a baldachino is erected. But he was inexorable, and urged that the great space allowed of a richer and more important structure; that the baldachino (and altar beneath), being the focus of the cathedral, ought to be presented as he had thought it out. The question of material presented less matter for discussion. Mr. Bentley had thought of a somewhat pale Siena red marble for the columns, but gladly accepted onyx as richer and preferable. But onyx, it was reported by the marble merchants of London, Belgium and Paris, was not to be obtained in greater lengths than 5ft. or 5ft. 6in., and columns of 15ft. were needed for the baldachino. All the columns in the cathedral are monoliths, and the baldachino ought to be reared on nothing inferior.

The Cardinal, however, had a friend in Marseilles, M. Cantini, who had supplied the marbles to the new Byzantine cathedral in that city, and is the owner of quarries of onyx in Africa. But onyx monoliths of the length required for Westminster had never been produced; and although the owner of these quarries thought he could supply them, he said that it would require many months to do so. The winter passed in fruitless endeavours, but at last his efforts have been crowned with success. The desired lengths are secured in onyx doré and in onyx nuagé—superb columns that will be worked with an entasis. Many who have visited Rome will remember the onyx columns, sometimes called Egyptian alabaster, that support the baldachino in the Church of San Paolo fuori le mura. These are not in reality monoliths, though often taken to be such, but are made in three pieces joined together. The effect of their transparency and colour is not easily forgotten.

It is proposed to allow these columns to be presented by persons who desire to take a part in raising this noble structure over the high altar. On the front part of the white marble base, upon which the onyx shaft will stand, may be engraved, either in the marble or in metal gilt, architecturally and according to precedent, the shield or armorial bearings of the donor. The upper part of the baldachino is of white marble, inlaid with mosaic and surmounted by a cross. It will be of striking appearance and worthy of the late Mr. Bentley.

The Great Crucifix.

Mr. Bentley designed a great cross 30ft. high, of Byzantine form, to hang from the triumphal arch which divides the sanctuary from the nave. It is being actually carved in Belgium. A figure of Christ is to be painted thereon, with the four evangelists at the extremities. On the reverse side, towards the altar, will be painted a figure of the *Mater Dolorosa*. This crucifix will dominate the whole cathedral by its majestic presence, and will be the first object to catch the eye on entering.

The Flooring of the Cathedral.

Mr. Bentley had prepared a marble floor of great beauty and originality. Among other details there were squares of cipollino marble in which were set fishes of a slightly red-tinted marble swimming in the rippled waves of the sea—in allusion to the thought that the Church is a ship, *navis*, bearing her burden safely over the sea of this life.

Nothing could be more stately or more beautiful than such a floor. But unfortunately various other considerations enter into the question of its immediate adoption. The economic consideration might, under present circumstances, be considered sufficient—that its complete execution throughout would cost £15,000. But even if the funds for such a purpose were at hand, the claims of hygiene and of comfort

that the cathedral must be opened absolutely free of debt. For that purpose a further sum of £16,000 is needed.

THEORY AND PRACTICE.

By J. L. ROBINSON.

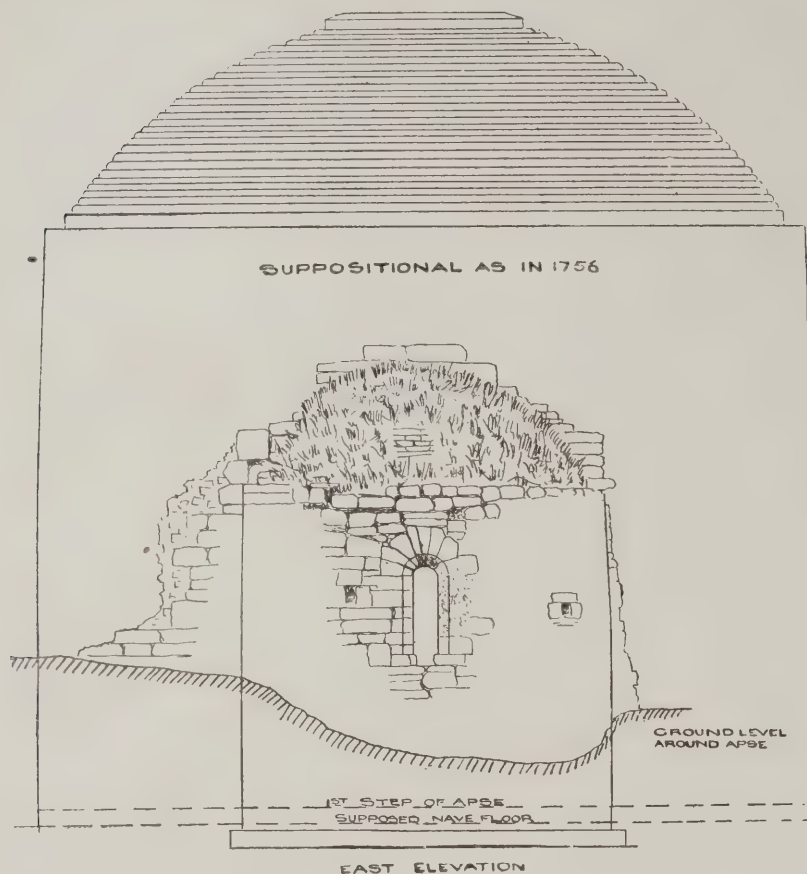
LECTURING and theorising on architectural subjects have not always been attended with practical results. A great many clever and ingenious elucidations have fallen rather flat. The professional art proselytizer, for instance, inculcates opinions and doctrines that for many reasons do not work out satisfactorily, or he is accustomed to "air" crotchets that he would not care to put into practice. For example, there have been many elaborate discourses on



THE ROUND CHURCH OF ORPHIR, ORKNEY: VIEW OF ARCHWAY TO APSE FROM THE WEST.

assert themselves with a positive defiance. The experience of the cold that seems to arise from a marble pavement, even where covered with matting, is against the employment of marble. In Vienna the marble floor of the cathedral is overlaid with boards during winter; in Spain the floors are covered with mats; and even in St. Peter's in Rome a plank is put down on which the deacons stand while they sing the Passion in Holy Week. Again, it is said that the noise of moving chairs on a marble floor is extremely disagreeable and distracting, as many will remember from their experience, for instance, of the Gesù in Rome and of other churches where movable chairs are in use. For such reasons, therefore, as the foregoing it has been decided, at least for the present, to use a wood-block flooring, which, altogether apart from a consideration of economy, is warm, noiseless and comfortable. The narthex, however, will contain Mr. Bentley's marble flooring and the piers and columns will be bound together by a marble framing, so that the wood block will appear as a canvas enclosed in its frame. The cost of this limited quantity of marble flooring will be something over £1,000, according to the estimate sent in by Messrs. Farmer & Brindley.—Cardinal Vaughan says

the use and treatment of materials such as brick, terra-cotta, iron and plaster, in which the author has laid down certain hard-and-fast rules as to their treatment in design that could not be followed with any degree of practical success simply because the practical limitations of the manufacture have been neglected or purposely ignored. On the architectural treatment of ironwork, for instance, it has been stated that the architect should repudiate all covering and concealment and exhibit the bare iron, the steel columns and girders; and the same class of "muscular" theorists, in speaking of iron or timber construction, have strenuously opposed all sorts of plaster or wooden encasings, ceilings and the like. Theory and practice have the unfortunate habit of running on separate lines, and this is mainly due to education, and we may illustrate this by taking the technical school and the ordinary apprenticeship mode of instruction. The work done in classrooms and technical schools is done under conditions so different from those of actual work in the office and factory that the student remains in ignorance of the real workman's methods. The school or classroom turns out a proficient man in geometry, mechanical problems, or a student well up in the history and nomenclature of art and decora-



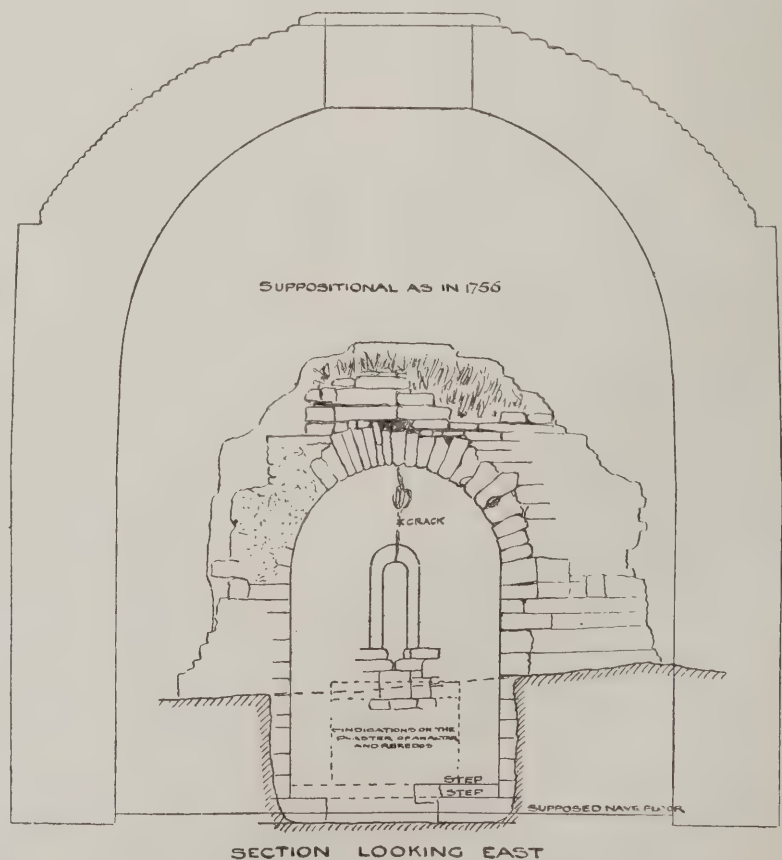
tion. When, as often occurs, he assumes the rôle of a lecturer, his views on architecture and art are very different from those of the man brought up in an architect's office, who has had the run of buildings in progress and the workshops. To the classroom student, it is true, the unexpected never happens, and it is easy for him to lay down hard-and-fast rules. On the other hand, the practically-trained architect has to encounter difficulties directly he begins to make out working drawings. A learned professor some years ago, in speaking about the architectural use of ironwork, suggested that the engineering forms of girders should be taken and simply decorated by applied ornaments or castings—a practice that would be readily acceded to by all ironworkers as not encouraging any radical change. Here we may draw a distinction between those who suggest difficult and impracticable modes of executing work, as the "art faddist," and those who preach easy and accommodating doctrines. Against both these sets of teachers or professors the student may be on his guard, though the former class are often honest and sincere, and have, moreover, the prejudices and traditions of the profession to fight against, and are on this account worth listening to. It is rather the latter and more ordinary kind of instructor or theorist to whom reference is now made. He may be thoroughly competent in the theory of his vocation, whether it is on construction, on the use of materials, on styles, on planning or on decoration. What he has to say is often full of common-sense, but he is uncompromising in tone. His opinions on these subjects are often of the most assertive and personal kind, that will brook no opposition or discussion.

A few of these self-imposed teachers of architecture and art are men of undoubted ability in particular spheres of work. One could name a dozen or more who are trying to place the profession on a higher basis, to rescue it from the odium of the mere "5-per-center," and who are endeavouring to raise the crafts to their old position. They have the noble but hopeless task before them of striving to stem the overwhelming tide of Philistinism and popular tastes, and of resisting the influences of prejudice and traditions. The attempts they have made to put their opinions into practical shape have not been very successful, either from their total rejection

of precedent or their adoption of ideas based on *a priori* assumption. Their designs often exhibit a crude style or individual eccentricity in the treatment of plan and detail.

How many of those who have essayed new theories of design and construction have given us any practical exemplifications of their views? During the last half-century we have had exponents on metallic systems of construction which should be light and elastic and dispense with all the difficulties and risks of stone or masonry construction; others have proposed systems of construction in which concrete and steel should be the main elements. Many well-known authorities have dinned into our ears the fact that architecture has ceased to be a living art, and that the only hope of inventing for ourselves a true and appropriate style is to set about it in the way the old builders did, when princes, priests, masons and others worked together through centuries, lending the aid of their experience and reasoning. Each improvement or phase of style was not due to individuals, but to all classes working together with the same aim. No one can dispute this statement, and in fact the uncontracted buildings of to-day are built much on the same lines—engineering structures are supposed to be, at least. But these advocates of the old system fail equally to show us how this process is to be applied in our present conditions.

Theories of planning also seldom work out well or find acceptance with the profession. A few are mere visionaries: they are ingenious, well-intentioned theorists who propound ideas of their own on various subjects. There are some in the profession who are "strong" on proportions, and who are continually advocating the principles adopted, or asserted to have been adopted, by the Greek and Middle Age builders. Exponents of Egyptian and Greek Vitruvian proportions still exist. Plutarch and Plato both give a triangle as the principle which the ancient Egyptians applied to their edifices, such that the side that makes the right-angle is 3 units in length, the base 4 and the hypotenuse 5, and these geometrical ratios were applied in determining the distance apart, or the intercolumniation of colonnades and porticos, and the transverse section of buildings, as the cathedral of Amiens,



THE ROUND CHURCH OF ORPHIR, ORKNEY.

which is obtained by two such triangles superposed. Then we know that most of the transverse sections and façades of our cathedrals have been proportioned on the equilateral triangle, which completely satisfies the eye. No one will deny that a harmony of proportion is established on the basis of certain geometrical formulas, as proved by M. Henszmann in his work "Théorie des Proportions Appliquées dans l'Architecture," and by many English writers given by Gwilt. These relations were possibly used in determining the plans, sections and façades of temples and cathedral churches, but they would be inapplicable to most modern buildings. Formulations of geometrical and harmonic proportions are clever, but their systems do not easily lend themselves to the modern architect.

THE ANARCHIST RODIN.

A Royal Academician's Censure.

IT is not to be expected that the strange work of M. Rodin will meet with approval in all quarters: it is not to be expected even that it will meet with general approval: but it has nevertheless passed through the ordeal of critics and is now regarded by the chief of them, both in this country and abroad, as the work of a genius.

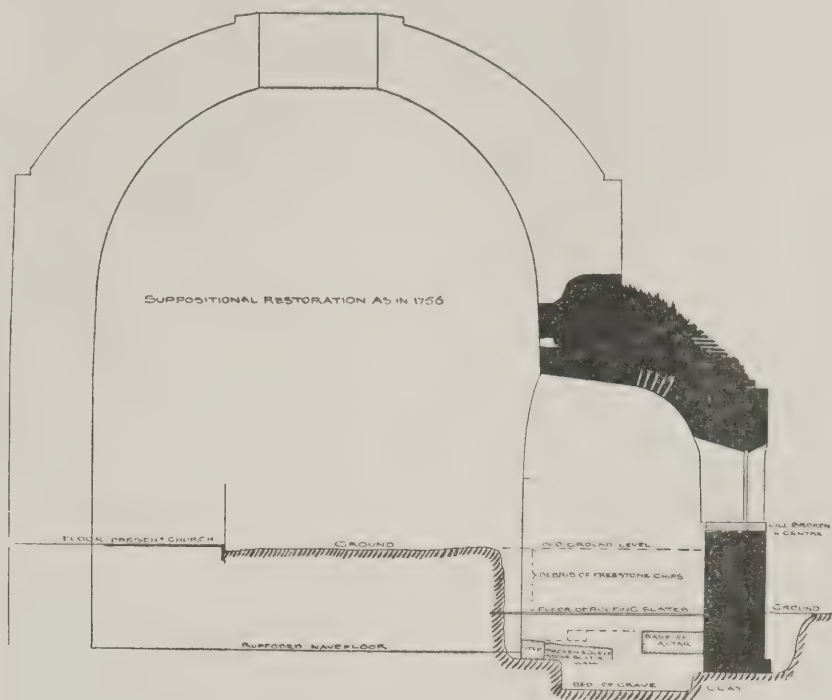
Now that the statue of St. John the Baptist has been added to the South Kensington collection, Mr. William Yeames, R.A., the well-known portrait-painter, takes the opportunity to express his dislike of the French sculptor's methods. "We have always been led to understand," he says, "that the object of the Museum was to collect not curiosities but works of art, not only for the culture of the art student but as a refining influence on the nation at large, holding up the beautiful as the ideal to be aimed at. Now the first impression of the bronze statue of M. Rodin is that of grotesqueness. Two heavy legs, placed like calipers on a board, and out of character and proportion with the rest of the figure, support a weak, misshaped torso, narrow-chested, with a deep indenture in the right side; the arms and hands are small compared with the legs and large feet; and as for the rounded back, it has shoulder blades projecting and forming strange eminences such as are seen in a map in relief. The head is that of an old peasant, ignoble and characterless. Then, why completely naked? We are told in the Scriptures that St. John was clad in raiment made of camel's hair, and we know that never in the East is a man seen without a loin cloth round him. I understand that M. Rodin modelled his figure from an Italian peasant, and no doubt chose an action to his taste, with one hand pointing up and the other pointing down, and imitating nature without selection or compromise of any kind. When the work was done he called it 'St. John the Baptist,' no other title (*faute de mieux*) suggesting itself to him.

"Every tradition of art derived from the Greek and Italian masters, which have survived some of them for the last two thousand years, is set at naught in the French sculptor's work, which has been put in a most prominent position in the Museum, holding the place recently occupied by a superb work of Michael Angelo. Are we to conclude that a new departure is to be set on foot in the teaching at South Kensington, and that anarchism in art is to be inaugurated?

"Every teacher in art is aware that the tendency of a student is always to accentuate the defects and peculiarities of any object he reproduces when set to copy it, and the same may be said of all followers and imitators of the mannerist. We may in consequence expect that those of our students who come under the influence of the art of M. Rodin will not stop at his grotesqueness and ugliness of form, but will soon drift into producing such revolting monstrosities as to entirely preclude the possibility of their exhibition in our public galleries."

A New Church and Schools at Sharpness has been erected. The architect was Mr. P. Phipps, of Yorkley, and the contractors Messrs. Orchard & Peer, of Stroud. The total cost of the scheme is about £2,100.

INCHES 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 FEET.



SECTION LOOKING NORTH

THE ROUND CHURCH OF ORPHIR, ORKNEY.

Law Cases.

Building over Sewers.—At the Sheffield Police Court last week a builder named Thomas Kyme was summoned for erecting a building over a sewer contrary to section 26 of the Public Health Act. Mr. H. H. Brown prosecuted on behalf of the Corporation, and stated that some time in last year defendant put in the plans for a wash kitchen in a yard in Penistone Road, Sheffield. When this had been erected defendant proceeded to cover over the space set out on the plan as a cart shed, under which ran a sewer of the local authority. There was a space partly enclosed by three walls, and without permission defendant had proceeded to put a roof over it. The policy of the Corporation with regard to such matters was that all sewers, especially where there were manholes, should be kept clear, so that the Corporation officials could have free access to them. Eight houses drained into the sewer.—The defendant said that he had simply put a roof over the shed to keep his cart dry. He suggested that the manhole should be removed outside the shed.—It was pointed out that that would be impracticable.—Alderman Clegg said that the Bench had no doubt that the building came under the section of the Act. Defendant had set the Corporation at defiance, and would have to pay 40s. and costs.

Masters' and Men's Unions: Alleged Conspiracy.—At the Blackburn County Court last week his Honour Judge Coventry gave a decision of considerable importance to the building trade. An action was brought by Robert Lever, plumber, for damages against the local Master-Builders' Association and the secretary of the Operative Builders, who, it was alleged, conspired to prevent him from carrying on his trade. The plaintiff, it appeared, obtained a contract in connection with certain houses upon which joiners' work was being done by a firm named T. Higson & Sons, among whose hands there had been a strike. He alleged that as the result of a meeting on the subject of the strike an agreement or understanding was made between the masters and workpeople's representatives that if the workmen would allow the existing contracts in which Messrs. Higson were linked up with the masters to proceed, the latter would bind themselves not to work upon any job where Messrs. Higson were employed, and not to employ

them in any building operations, and, further, that if any of their members dared to work with Messrs. Higson the same treatment would be meted out to those members as to Higsons'. As the result of that the operative society interfered, and put a stop to the job.—The judge held that there was no evidence of conspiracy, nor was there a shred of evidence that the defendants were actuated by any other motive than their own benefit. There was no evidence that they were acting maliciously or vindictively against plaintiff. Therefore, he found for the defendants, with costs. Stay of execution was obtained in view of a possible appeal.

Faulty Building Alterations: Action against an Architect.—At the Preston County Court last week a butcher named Turner brought an action against William Milner, architect, of Preston, to recover damages in consequence of defendant's alleged negligence in connection with certain alterations at plaintiff's premises. There was a counter-claim for £10. Some time ago the plaintiff bought the private house, No. 31, Fishergate Hill, intending to turn it into a butcher's shop. Plans were prepared by a Mr. Seed, and the defendant was requested to supervise the execution of the work. The alterations included a meat-rail which went all round the inside of the shop and through the doorway in front. This rail was fixed with screws 3in. or 4in. long screwed into a piece of wood from 1in. to 1½in. thick. The rail collapsed when a quantity of meat was hung on it, and the plaintiff claimed £50—£9 1s. and £4 12s. paid for refixing the rail after the first collapse, and £36 estimated as necessary to put the premises into proper condition. Mr. M. Rawcliffe and Mr. J. A. Seward, architects, gave evidence: both stated that the rail was quite inadequate. The defendant stated that he was formerly building surveyor to the Preston Corporation and also to the West Lancashire District Council. He contended that he had no idea that the plaintiff ever intended to place such heavy weights on the rail as he did.—His Honour in giving judgment said the whole construction was unfit to carry a weight of three tons. Plaintiff was entitled to a reasonable sum for the extra work which would have to be done, and he thought that would be met by a sum of £15. He gave a verdict for that amount, plus the £9 and £4, and also found for the plaintiff on the counter-claim with costs.

WANSFORD CHURCH RESTORED.

THE ancient church of St. Mary the Virgin, Wansford, was reopened recently after restoration. Nothing has been done to disturb the antiquity of the building, the only addition being a new chancel. Briefly, in the restoration scheme the tower has been underpinned and the old weathercock taken down, repaired and re-fixed. The north and south aisles have been increased in height, and clearstory windows have been added, a new oak roofing taking the place of the former low flat plaster ceiling, with lead covering on the south side and slate covering on the north. The floor and the space allotted for seating is of wood blocks, and York stone paving has been used in the aisles. In excavating for the paving an old font was discovered, which it is thought was the original font of Wansford church. This has been used as a base to the other unique and interesting font, which is thought to have come from a neighbouring abbey now lost sight of. New heating apparatus has been fixed. With the chancel which has been added there is an organ-chamber and vestry. In excavating for the foundations of these new portions the foundations of

WESTMINSTER ABBEY AND THE CORONATION.

FROM the western door of Westminster Abbey to the choir entrance wooden stages rising tier upon tier have been erected on each side of a broad central pathway to the walls of the aisles. Additional accommodation has also been made by the erection of temporary galleries between the arches of the aisles. The whole of the woodwork will be covered with cloth, and the cloth hangings to the fronts of these galleries will bear a pattern consisting of Tudor roses and regal crowns. The altar frontal has been designed by Mr. J. T. Micklethwaite, surveyor to the Abbey. The frontal is of red and gold, and the gallery hangings will be either of a dull yellow colour or a dull blue.

A great change has been made in the appearance of the organ gallery, which is situated above the gateway through which access is gained from the nave to the choir. The central part of the organ in ordinary circumstances occupies the greater part of this gallery. The pipes, &c., have now been removed to the sides so that the gallery is quite clear and can be used for seating a considerable number of

Tudor roses and crowns. The ancient Coronation Chair is at present in Henry VII's Chapel, and will be re-decorated for the ceremony.

Both the north and south transepts have had tiers of seats erected in them, rising to a height of about 30ft., with galleries beyond them. All the occupants of these seats will be in sight of "the theatre," and most of them will also command a view of the altar. The triforium has also been fitted with seats, from which much of the historic ceremony will be visible. The greatest precautions have been taken to prevent the slightest injury either to the fabric of the Abbey or to monuments it contains. Before any of the stages were raised every tomb, statue and bust which might otherwise have suffered damage was covered over with stout timber, under the eye of the dean.

Builders' Notes.

Mr. T. Carnill, builder and contractor, of Lowdham, died recently.

Mr. Andrew John Jaffery, master plumber and decorator, of Alderley Edge, died recently.

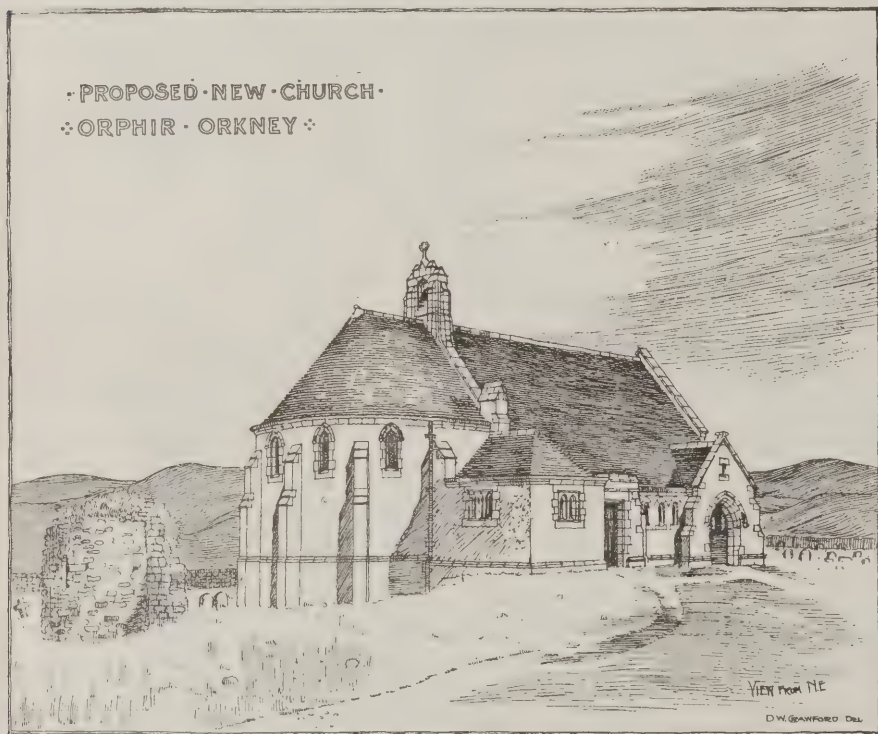
Mr. H. C. Stork, of Morford Street, Bath, died last week at the age of thirty-nine years. He secured the important contracts for the plumbing work at the Municipal Buildings and Technical Schools, and was a leading member of his trade. He was a member of the Bath Master-Builders' Association.

Messrs. R. Waywood & Co., Ltd.: Annual Report. —The annual report of the directors for the year ending March 31st last was presented to the meeting of shareholders in this company held at the Cannon Street Hotel on Monday last. The profits (including £3,670 brought forward from last year) amount to £24,127. A dividend of 10 per cent. per annum was recommended for the six months ending March 31st last, making, with interim dividend already paid, 7½ per cent. for the year on the ordinary shares, leaving a balance of £3,698 to carry forward.

London County Council. —At last week's meeting of the Council, on the report of the Building Act Committee, Mr. Radford asked whether the Council had granted a certificate under the London Building Act, 1894, as to the sufficiency of the means of escape in case of fire with respect to the premises in Queen Victoria Street, where the loss of life occurred the previous day. Dr. Longstaffe (chairman of the Committee) said that no certificate had been granted. A considerable discussion followed. —It was decided to postpone, until after the summer recess, further consideration of the question of naming the new street and crescent from Holborn to the Strand. Mr. Yates has given notice to move that "King's Way" be substituted for "Edward VII. Street."

Breeze-concrete in Fireproof Construction. —Writing in reference to the disastrous fire in Queen Victoria Street, Mr. Henry B. Sang, architect, says:—Offices, warehouses, factories, &c., should be built of an absolutely fireproof material, and not of breeze-concrete, which is the most dangerous concrete that could possibly be used. The breeze retains the heat, and consequently destroys girders, columns, and all metal work, so that the building collapses. I advised the use of a cheap and absolutely fireproof concrete, and that all ironwork should be encased with this simple, inexpensive and non-conducting material. I guarantee that if this were done a calamity like this could not possibly take place. The London County Council should also frame an Act to compel builders to erect all buildings in such a manner as to protect both life and property in workshops, factories, &c. All such lofty buildings should also have exterior iron ladders or staircases, providing means of escape. The insurance companies should take the matter seriously into consideration and refuse to insure buildings where breeze-concrete has been used in the construction.

In Alington Church, near Ottery St. Mary, a memorial tablet to the late Lord Coleridge, Lord Chief Justice, has been erected. It is designed in the Decorated style, and is of polished English variegated alabaster and Caen stone. It is fixed upon the northern wall. The work was carried out by Messrs. Harry Hems & Sons, of Exeter.



A. W. JOHNSTON, F.S.A. SCOT., ARCHITECT.

the original chancel were revealed, almost the same size as the one just completed, and in the east wall of the nave responds an arch was discovered built in the masonry. The new chancel is in the style of the fourteenth century. The roof is of oak throughout, pointed arch shape, boarded and divided by moulded oak ribs, the portion over the sacrum being richer than the rest. The flooring is of Ketton stone and slate squares alternately. In the windows and vestry door old parts discovered during the excavations have been restored to their original use. The seats in the chancel are of English oak fumigated and wax-polished, the old altar table being retained and made larger. The pulpit has been made up of the remains of the former Georgian pulpit, and the reading desk fumigated to harmonise with the rest of the fittings. The ancient glass has been most scrupulously collected and worked in. Lamps of an unobtrusive and simple design have been supplied by Mr. J. W. Willcocks, of Stamford, and the glazing has been done by Mr. R. P. Collett, of Leicester. Mr. S. E. Halliday, of Stamford, was the contractor, and Mr. J. C. Traylen, A.R.I.B.A., of Stamford, the architect. The old church may be described as entirely Early English. The font is of Norman date. The tower is tenth-century Saxon.

persons. The choir itself has not been touched, the authorities having deemed it inadvisable to interfere with the fine old oaken stalls. "The theatre" in which the Coronation ceremony takes place will, as at previous Coronations, be in the space under the lantern. The ordinary benches have all been cleared away, and a timber staging, a couple of feet or so in height, has been erected on the open space thus provided. This staging or "theatre" is on a level with the sacrum, and is covered with purple cloth. The pulpit, which is at the north-east corner of "the theatre," has not been interfered with.

No alteration will be made in the sacrum, except that the few seats it contained have been removed, to be replaced later on by chairs of state. The only alteration to be made in the appearance of the altar, where the King and Queen will be crowned, will be effected by the use of the specially-designed altar cloth, frontal and frontlet already described. The Chapel of St. Edward behind the altar, where at the close of the Coronation office the King and Queen will put on their royal robes of purple velvet, has undergone no structural alteration, but it has been decided that the tomb of the Confessor shall be draped with a pall of red velvet, stamped, like most of the other drapery, with

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Entasis on Columns.

LONDON, N.—H. S. writes: "I have completed my 'testimonies of study' for the R.I.B.A. intermediate examination, but have put no entasis on the columns of the Orders. Is it essential to do so?"

The drawings should, of course, be accurate, and must have the entasis correctly drawn.

"Plenum" System of Ventilation.

NORWICH writes: "What is the principle of the 'plenum' system of ventilation? To whom could I apply for the cost of an installation in a large school?"

The "plenum" system of ventilation consists in blowing air into the building by mechanical means. There are several firms that specialize in this class of work. The "Ventilating Engineer" section of "Specification, No. 5," gives full information on methods of ventilation, with names of specialists in its advertisement pages to whom you should apply to for quotations, &c.

Maximum Span for Straight Arch.

CORK.—W. writes: "Which is the best method of spanning a 7ft. opening in 9in. facing brick-work? Can it be done with a flat arch? If not, kindly let me know what is the largest span that a 9in. flat arch will carry, assuming the superstructure to be of ordinary weight. What, also, is the largest span a 14in. flat brick arch will carry under ordinary conditions?"

The conditions are not quite clear. It is assumed that 9in. brickwork is used for facing to a stone wall, and that it is desired to make a straight arch 9in. wide on face over an opening. It is a matter of opinion only, but I would not care to use an arch of this kind over a greater width than 4ft. in one span, or if 14in. on face 6ft. in one span, and it would then be necessary to take the weight of the superstructure by a relieving arch inside or rolled joist built in.

HENRY ADAMS.

Roof of Large Hall.

LONDON.—QUERCUS writes: "I have to roof a large hall as shown on sketch (not reproduced) about 40ft. wide. It has a barrel-vaulted roof and good abutment at each side. I wish to use trusses of iron or steel, but so constructed that no iron tie-rods show within the hall."

If you have to roof the hall you should apply to the architect for a drawing, who in turn might have to apply to an expert for a design for the trusses. Work of this kind is of a responsible character, and is entitled to receive fair remuneration.

HENRY ADAMS.

"Architecture."

CARDIFF.—H. S. writes: "I have the numbers of 'Architecture' from its commencement in February, 1896, up to June, 1898. The last is No. 28, Vol. III. Was it the last number published? I have lost No. 19, Vol. II., August, 1897. Perhaps some reader would sell me a copy or state where I might purchase one."

No numbers of "Architecture" were published beyond No. 28. Mr. Batsford is unable to supply No. 19.

Payment for Paving Works.

QUERIST writes: "I am the owner of a piece of land in the borough of Hove abutting on the rural parish of Preston—in fact, the boundary passes along the centre of the pavement, leaving 4ft. in the borough of Hove and 6ft. with kerb channelling, &c., in the adjoining parish, and the part in the adjoining parish was originally a turnpike road. The Hove Council served the usual notice of intended paving and awaited objections; the owner of this land at that time objected on the grounds that the work was premature, but eventually withdrew his objection. The Hove Council have now applied

to me for payment for the work in connection with paving, and I have asked them to adjust the figures and charge me with that part within the borough. This they refuse to do, and threaten an action. Can they recover for work outside their borough?"

We presume that the whole of the works of the new footpath (whether within or just without the borough) were executed by the borough authority and done under the Private Street Works Act, 1892. The actual statutory position of the boundary is important, and the probability is that the line defined by boundary posts or stones is the legal one, otherwise it is difficult to understand how the authority came to execute works and expend money outside their district, which (except in certain special cases provided for by law) they have no power to do, and the auditor would be at liberty to call such expenditure in question. An authority therefore, having no power to expend money on works actually outside their area, naturally has also no legal means of recovery of such expenditure. The precise line of the boundary, however, appears to us in the present case to be important. An objection to the proposed works on the ground that the same are "premature" does not fall within the terms of clause 7 of the Private Street Works Act, 1892, to which reference should be made, and our correspondent's case we think is weakened by the fact that no legal "objection" appears to have been made by the then owner to the works in question during the period allowed by the statute for lodgment of such objections. We know of no parallel case which has been decided by the Courts of Law, but are inclined to the opinion that the authority will have doubtless secured itself with regard to the true boundary, and that our correspondent will find himself legally liable.

W. H. M.

Mansergh's Cast-Iron Gulleys.

CARDIFF.—C. writes: "Who are the makers of Mansergh's cast-iron gulleys?"

Many years ago a stoneware trap was designed by Mr. James Mansergh, past-president of the Institution of Civil Engineers, which was made by Messrs. Doulton, of Lambeth; but whether any makers have copied it in cast-iron we cannot say.

Differences in Specification and Bill of Quantities.

CARDIFF.—OMEGA writes: "If the amount of prime cost values is stated differently in a specification to that in a bill of quantities, which document is to be followed? The contract amount was obtained from the bill of quantities, which was checked before the contract was signed, and no remark made about the difference in the two documents."

The specification is the document to go by in case of dispute, but we should think that any self-respecting architect would be willing to rectify the mistake.

Payment to Assistants for Overtime.

HASTINGS.—W. C. W. writes: "What is the usual charge for architects' assistants to make for overtime?"

Payment for overtime is usually double that for ordinary time.

Sketching Holiday on the West Coast of England.

GREENOCK.—N.B. writes: "Kindly suggest a holiday on the west coast of England where a week could be spent and sketches made of good domestic and other architecture."

This query is somewhat vague, as the west coast of England is extensive; but as a general rule places of architectural interest lie somewhat inland. Cardiff is possibly the best centre, with Castel Koch and Caerphilly Castle in one direction distant about seven miles, and at about the same distance in the opposite direction Llantwit Major with its double church, its Celtic crosses and its Roman remains, and between it and Cardiff an Elizabethan mansion whose name I forget, lying in a dilapidated state but still highly interesting. Llandaff Cathedral is also not far off. Another good centre is Chepstow, with its own castle within the town, and Raglan Castle and Tintern Abbey within three miles. All along the Somerset and Devon coasts there is good work to be found, but it is mostly ecclesiastical, the towers of the

Somersetshire churches and the screens of those in Devonshire being especially well known. Further north, Barmouth would be the centre for Harlech, while Carnarvon has its own castle. In Cheshire there is much excellent domestic half-timber work, but it mostly lies inland; and, further north again, Barrow is not very far from Furness Abbey.

G. A. T. M.

Flat Roofs.

EDINBURGH.—G. M. writes: "What would you recommend to be used for a flat roof on which the occupant of the house intends to have flower pots, &c., and to walk a great deal?"

We recommend you to adopt a concrete roof covered with asphalt, which will be perfectly watertight and stand considerable wear.

Notices to Enforce Repairs to Houses.

LONDON, N.E.—M. A. S. writes: "What is the form of notice to compel the leaseholder of certain premises to repair the houses under his covenant? Also, what books deal with the matter?"

No special form of notice to compel a leaseholder to repair under his covenant in the lease is required. A letter should be sent pointing out the necessary repairs and giving him a reasonable time in which to execute them, coupled with an intimation that if the same were not executed within the given time proceedings would be instituted against him, under his covenant, for damages. The proper proceedings would be (if the matter in dispute is sufficiently large, say of £50) by a writ in the High Court for "damages for breach of covenant." Cases of this kind are usually tried before a judge and jury, who assess the amount payable. In many leases breach of a covenant determines the tenancy. There are no special books dealing with querist's point. The law dealing with breaches of covenant to repair is on all-fours with that applicable to breach of any other covenant, and may be found in any textbook on landlord and tenant, and in Broom's or Stephen's Commentaries on the Common Law.

W. JOHNSON-ROBERTS.

ARCHITECTS IN THE COLONIES.

Illicit Commissions.

THE following document has been drawn up by the Council of the Royal Institute of British Architects, and a copy sent to every member of the Institute practising in the Colonies:—

Whereas it has been stated on good authority that there is a growing tendency on the part of architects practising in some Colonies to take a commission from the contractor as payment for copies of the specification and the contract and other drawings, the Council of the Royal Institute of British Architects ask the co-operation of all Colonial members of the Institute in endeavouring to check this evil, as they are convinced that, if allowed to grow, it is one that must undermine and eventually destroy that feeling of confidence between the public and the main body of architects which it is one of the chief aims of the Institute to promote. The Council would point out that the following declaration to refrain from this and similar practices is made by every member of the Institute before being admitted to its ranks:

"In consideration of my having been so elected I promise and agree that I will not accept any trade or other discounts, or illicit or surreptitious commissions or allowances, in connection with any works the execution of which I may be engaged to superintend or with any other professional business which may be entrusted to me."

If, however, it is the custom in any Colony for the builder to pay for copies of the contract drawings, a fixed sum should be charged, and this sum should be stated in the specification, and should not be in any way in the nature of a commission. The practice by which an architect holds a contractor's deposit for work contracted for and then demands a further percentage before granting a certificate is entirely to be condemned.

Bricks and Mortar.

APHORISM FOR THE WEEK.

'Tis up and down carved like an apple tart.

Our Plates. THE house on the Warren has recently been built at Royston, Herts. The site is on the side of a valley in the chalk hills, across which it looks into a wood. As a former house was removed for the present one to be built, a well-grown garden was already in existence, on which it was desired that the new work should encroach as little as possible. This, and the fact that the ground slopes away, have influenced the plan to a considerable extent. On the upper floors are six bedrooms, dressing-rooms, box and store spaces, bathroom, w.c., h.m.c. and linen cupboard. The refuse from the stable is removed into a space below it, and so direct to the kitchen garden. The materials are Cambridge-shire yellow stock bricks, hand-made tiles for roof and tile-hanging, wood sashes and frames and plastered eaves. The contractor was Mr. R. W. Worboys, of Basingbourne, Cambridge-shire, and the architect Mr. Geoffrey Lucas, A.R.I.B.A., of 5, Bloomsbury Square, W.C.

Dublin College of Science. THE following resolution was passed at the meeting of the Council of the Royal Institute of the Architects of Ireland on June 2nd:—The attention of the Council having been drawn to a statement by Mr. Austen Chamberlain in the House of Commons on May 28th, thus reported: "As to the architect, before the Bill left the House he would give the name of the architect selected. No choice had yet been made, but he had been in communication with the Chief Secretary and the Department of Agriculture, who were entitled to a voice in the matter, and the claims of several architects, both Irish and British, had been considered. Personally, he should be most anxious to have an Irish architect, but, in any case, whatever was done hon. members might rest assured that the Government should associate an Irish architect with the work"—the Council deprecates that, only in mere concession to Irish sentiment, an Irish architect should be associated with an English architect in designing or carrying out the proposed Public Offices (College of Science) in Dublin. It resents the imputation conveyed publicly that in the opinion of the authorities of his Majesty's Treasury there is not in Ireland an architect of sufficient reputation and capacity to design and carry out such a work as sole architect in the usual manner.

An International Art Competition. THE management of the Universal Exhibition to be held in St. Louis, U.S.A., to commemorate the purchase in 1803 of Louisiana, "by which a territory greater in extent and natural resources than that of the original thirteen States was added to the Federal Union," desire to obtain an artistic emblem illustrating this event. The design must be executed either in relief or in colour. It is to be adapted for use as the official seal of the exhibition, as a medal, as a letter head for stationery, as a poster, and for any other purpose connected with the dignified expression of the purposes of the exhibition. If colours are employed, these must be limited to red, blue, yellow and white. To the author of the design which is selected as the best by a jury of seven members (two painters, two sculptors, two architects and a historian) the exhibition authorities will award a prize of 2,000 dols., the chosen design then becoming their property. The following have been appointed to serve as members of the jury: Mr. Frederick Dielman, president of the National Academy of Design, New York; Mr. John la Farge, president of the Society of American Artists, New York; Mr. J. Q. A. Ward, president of the National Sculpture Society, New York; Mr. Lorado Taft, president of the Society of Western Artists, Chicago; Mr. Charles F. McKim, president of the American Institute of Architects, New York; Mr. Wilson Eyre, president of the Philadelphia Chapter American Institute of Architects, Philadelphia; and Prof. Alcee Fortier, president of the Louisiana Historical Society, New Orleans. If the design is

in circular relief, it must have a diameter of 20in.; if not circular it must have slightly greater surface dimensions. It must show the style of lettering and the date, and, since it may be employed for a medal, the recommendation is made that a design for the reverse side should also accompany it. If from the sketches submitted it should be thought proper to make a poster to be reproduced in colour, the drawing must be upon canvas or carton. The greatest freedom must be exercised by artists in the treatment of the subject, the only condition being that the completed work shall be artistic, appropriate, effective and susceptible of employment in the various forms already mentioned, and that it shall also symbolize the great historical event to be commemorated. This was, in brief, the acquisition from France in 1803 of a territory which gave the United States permanent control of the great waterway, the Mississippi River. Designs are to be delivered in New York between November 1st and 5th, 1902, under regulations which may be obtained from the resident representative in the United Kingdom of the Universal Exposition, Mr. George F. Parker, Sanctuary House, Tothill Street, Westminster, S.W.

The Oldest Weathercock in England. THE venerable fifteenth-century western tower of St. Sidwell's, Exeter, quite the finest example of its period in that district, has for some time been under renovation, under the advice of Mr. E. H.



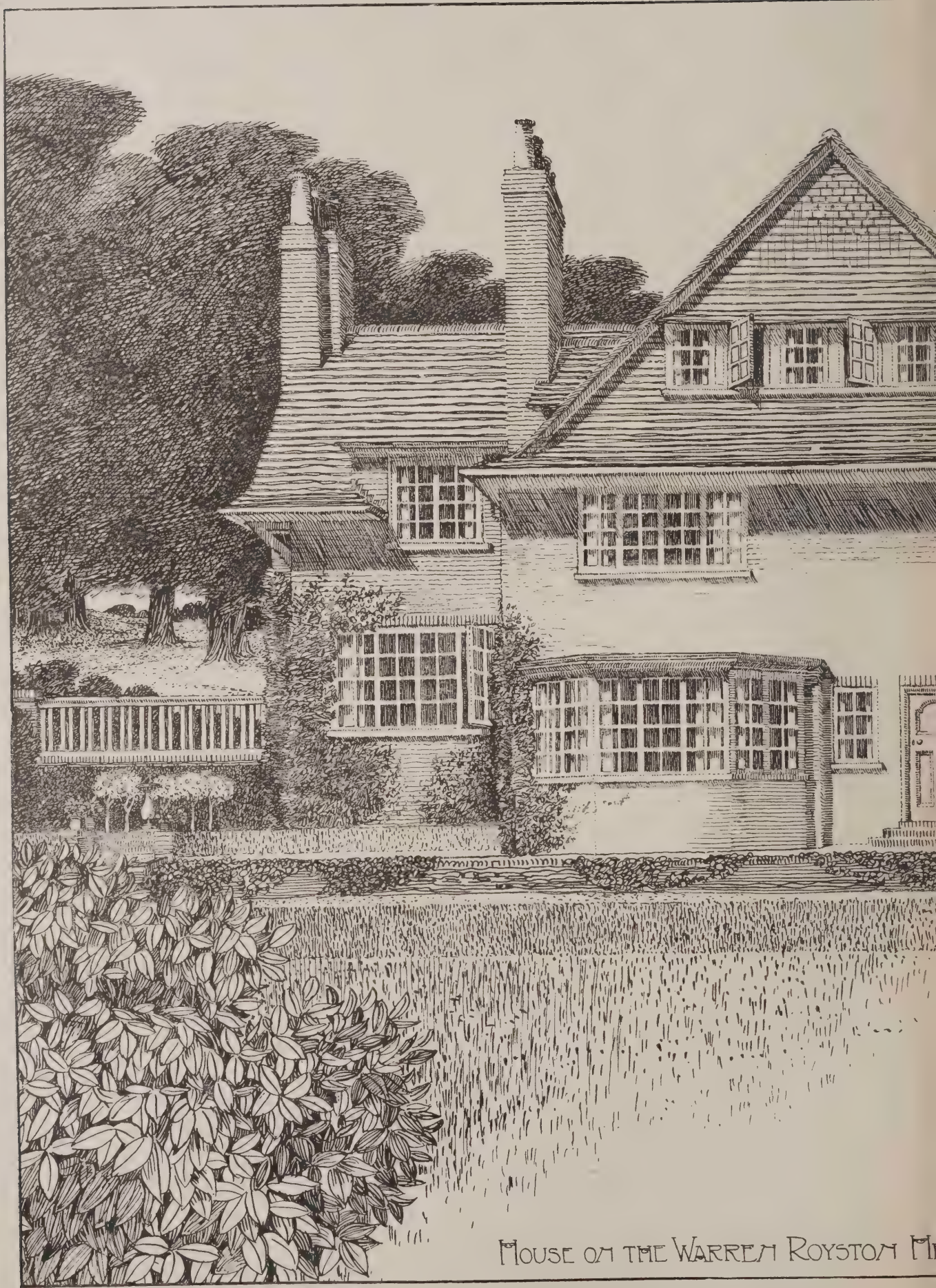
Harbottle, F.R.I.B.A., the cathedral architect. The ugly wooden spire that was placed upon it in 1812 has been permanently removed. It was surmounted by an ancient vane that, at a still earlier date, for many years crowned the dwarf spire that existed upon the northern Norman tower of Exeter's Cathedral, and was taken down when the spire in question was in turn by direction of Bishop Levington, removed in 1752. St. Sidwell's Tower renovation being now practically complete, the famous old copper chandelier, deftly balanced upon its original support of hammered and ornamental iron, has been fixed aloft immediately over the octagonal turret that rises slightly above the line of the embattled, parapetted tower upon the latter's south-eastern corner. The bird of which we give a photograph, taken by Mr. Harry Hems, on this page, measures 2ft. 9in. from the point of its beak to the extreme outside curve of the tail, and stands 2ft. 6in. high, and is forged in two pieces, welded together, hollow inside, its greatest thickness from out to out being 8in. The steady spindle below is carried up through the legs and into the body, exactly 12in. above the cup. It is an excellent specimen of some sturdy mediæval craftsman's craft, and was made in Exeter—so the Cathedral Fabric Rolls inform us—under the direction of Bishop Courtenay in 1484. Upon the cathedral's tower it remained for 263 years, when the spire and its attributes were removed. It remained on St. Sidwell's tower until May 2nd, 1899, when, the spire doomed, it was carefully taken down as a preliminary to the steeple's destruction.

The weathercock and vane are still in an excellent a working condition as they were the day before they left the blacksmith's forge.

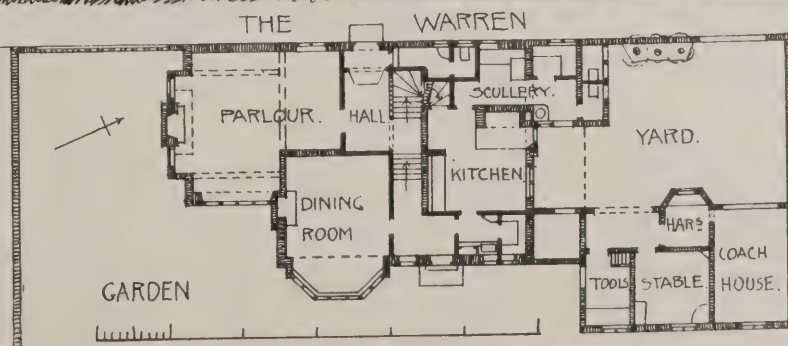
A Norman Font. THE Norman font in the parish church of St. Mary, at High Bickington, Devonshire, has just been restored by Mr. Harry Hems, of Exeter, who first had it bound together with cords (for it was then in no less than forty-five pieces). The remains were photographed, and, by constant and unwearying application of chemical all the whitewash, stucco and plasterwork which had been applied by successive generations of churchwardens, were removed, and the original stone left standing out in precisely the same condition as it was originally when the eleventh-century mason left it. As a rule, ordinary fonts consist of three distinct stones: the bowl, the supporting column and the base. At High Bickington, however, the font is formed of two only, the joint occurring in the midst of the central circular column. The whole is made out of rough local stone, in texture not unlike that procured from the celebrated Doulton quarries in the adjacent county of Somersetshire. The bowl in shape is what is known as a cushion capital, i.e., has its sides truncated, so as to form a square at the top. Curiously the stem below is not situated in the middle of the bowl, one cant of the latter projecting considerably more than do the other three. The whole is ornamented with the severe and singular-notched and nicked enrichment, so characteristic of the Norman period. The moulding below the supporting shaft is cabled. Much of the damage to the stonework had evidently been caused by the use of iron cramps, some of them evidently many hundreds of years old, let in to hold fractured portions together, and which by oxidation have helped to burst the stone. Mr. Harry Hems has taken out no less than 16lb weight of actual metal. The original leather lining to the bowl, of whose actual existence prior to the present conservative renovation, there was little or no evidence, now stands in its proper place, exactly as it did formerly, and although sadly hacked and much worn in places, it is happily preserved intact. The whole has been placed upon a plain foot-pace of grey Dartmoor granite.

Ashton Church Restoration. ASHTON CHURCH has been repaired. The roof was thoroughly repaired last year, and the work done since that time has consisted of the cleaning off the old rough-cast from the tower and pointing it. The stonework of the windows has been all repaired, and the old coloured glass, together with the old plain glass, has also been repaired, re-lead and placed as before. The original fifteenth-century seating has all been carefully pieced and restored. Two new seats have been placed in the south-west corner, and new flooring and cills laid almost throughout the church of best English oak. The interior walls have been cleaned down to the original plaster and whitened, while cement gutter has been put round the whole of the church to carry off the water from the roofs. Repairs have also been done to the south door, piers, steps, &c. During the process of the work it was found that the font had been moved to admit of a west gallery in late times, part of the old seating having been cut away for this purpose. The font has now been replaced in its original position, as the gallery has disappeared and the seating repaired. An interesting fresco representing our Saviour surrounded by the instruments of the passion, which has been brought to light by the removal of the plaster from under the Chudleigh memorial; also, the old colouring showing the lines of the original vaulting of the screen, and fragments of colouring on the east wall of the lady chapel, showing the original treatment of the walls—have been found. The probable cost of the whole of the restoration, as completed up to the present, will be about £1,000. Ashton Church is one of the most interesting little parish churches in Devonshire. It is said to have been originally dedicated in 1259, but the greater portion of the present structure must be of much later date. The screen, with its wealth of figures, is wonderfully preserved, and there is a handsome old Elizabethan pulpit with the sounding board, untouched by the restoration.

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WEST ELEVATION

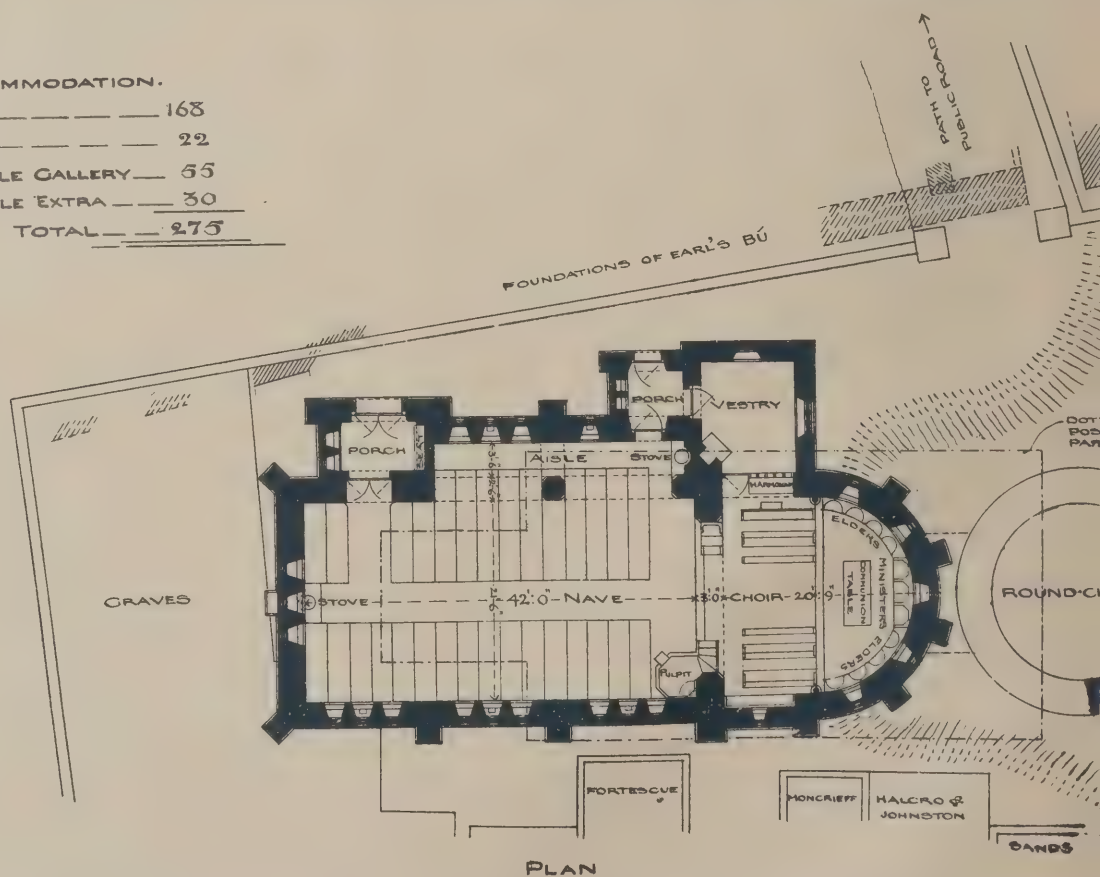
SOUTH ELEVATION

SUPPOSITION
ROUND CHURCH

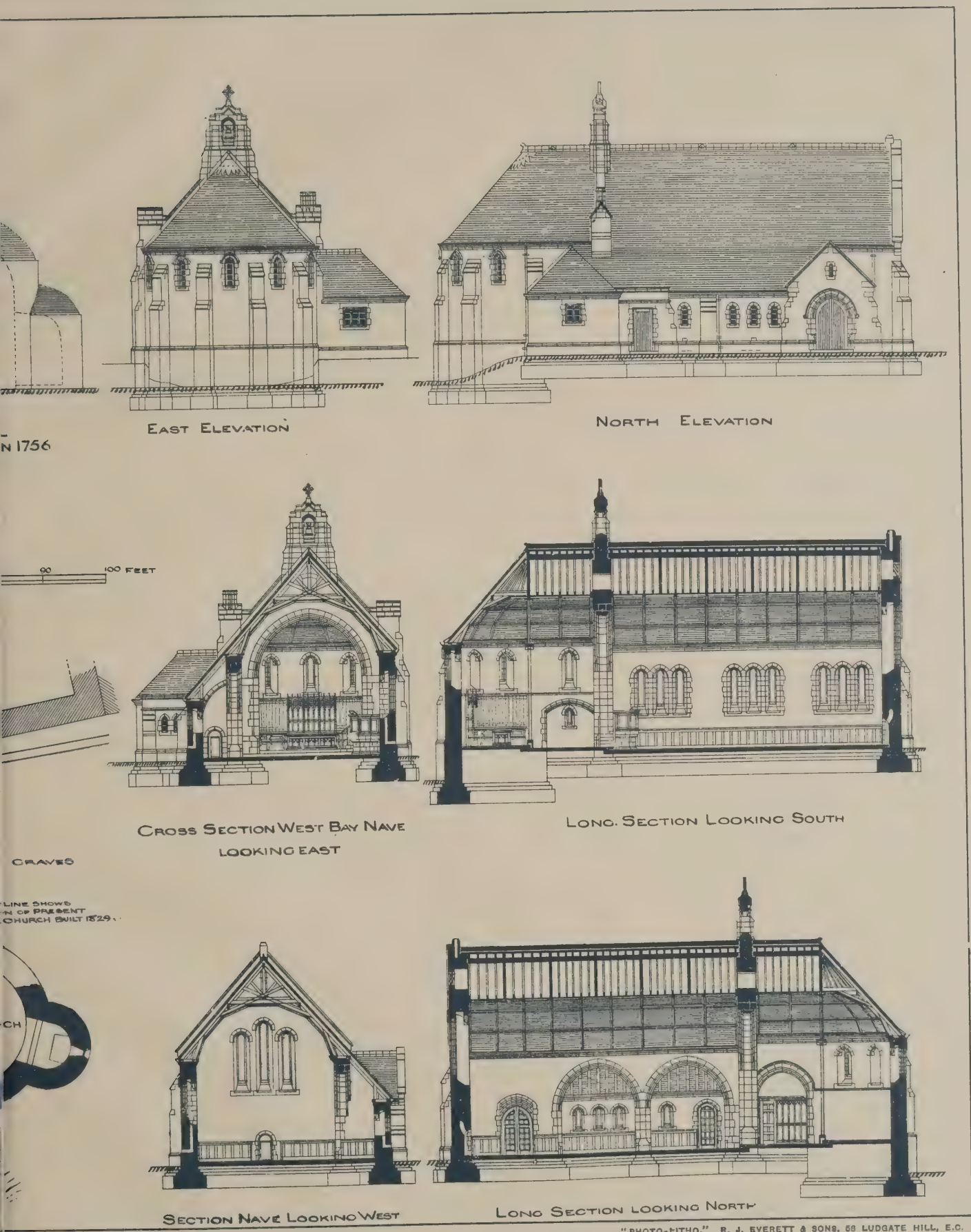


ACCOMMODATION.

NAVE	168
CHOIR	22
POSSIBLE GALLERY	55
POSSIBLE EXTRA	30
TOTAL	275



PLAN



EAST ELEVATION

NORTH ELEVATION

CROSS SECTION WEST BAY NAVE
LOOKING EAST

LONG. SECTION LOOKING SOUTH

SECTION NAVE LOOKING WEST

LONG SECTION LOOKING NORTH

"PHOTO-LITHO." R. J. EVERETT & SONS, 68 LUDGATE HILL, E.C.

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HOLBORN-STRAND DESIGNS.

The Report of Mr. Norman Shaw and Mr. Riley.

THE following is the report of Mr. Norman Shaw, R.A., and Mr. W. E. Riley, superintending architect to the London County Council, on the designs submitted by the eight selected architects for the elevations of buildings on the new Strand frontage and the crescent which will be formed at the southern end of the new street from Holborn to the Strand:—

23rd October, 1900.

We have studied the eight sets of designs submitted for the proposed new street from Holborn to the Strand with great care and with the deepest interest, and we are pleased to be able to report that in our opinion the architects invited by the London County Council have made a most admirable response to the invitation.

Throughout there is the strongest evidence that each architect has done his very best, and has left no stone unturned to produce a design which in his opinion would be worthy of this great opportunity, and though there may be a difference of opinion as to how some have succeeded, it is a great pleasure to be able to record the fact that not merely has a great effort been made, but that the measure of excellence attained is exceptionally high. Moreover each one has endeavoured to present a commercial adaptation of his design for the consideration of the Council, and has carefully observed the instructions issued, so that we have no hesitation in reporting that condition iii. has been amply fulfilled. (Condition iii. provided that the designs should be in conformity with the Council's instructions.)

It would be both unnecessary and invidious for us to go through all the designs and to attempt to allot to each what we conceive to be its relative place. Mr. Norman Shaw desires personally to say that he would rather have limited his recommendation to one design only, but as we have been requested to select the three best designs, we venture to submit the following remarks:—

It is with feelings of unalloyed satisfaction that we observe that the authors have almost unanimously adopted a large measure of restraint in their designs instead of the very florid and varied developments to which we have been too much accustomed in our street architecture for some years. We have in these designs mostly quiet and dignified productions more or less academic in character. We invite attention to this point, as there can be little doubt but that the result of these great "Improvement Schemes" which the Council are carrying into practical effect will exercise an immense influence on the architecture of London, and also in the country generally; and it is hardly necessary to dwell on the extreme importance of this being a good influence. It is much to be regretted that the eight architects were not given some indication of the style to be adopted, as we feel that the time has come when the hesitation between the claims of so-called classic and Gothic treatments, and the constantly disturbing influences of foreign architecture, must cease if we are to make any real progress, and that we shall do better in the future if we adhere more closely to the great examples we have of the English Renaissance, and follow on the lines bequeathed to us by such truly great masters as Inigo Jones and Sir Christopher Wren.

It is remarkable, however, that with no limitation of style, eight architects should have been found whose views and art were so closely governed by the influences of the Renaissance; but if the limitations of English Renaissance had been adopted, it would in our opinion have simplified the task and ensured a more direct and probably a more satisfactory result. It was this absence of limitation of style which has necessitated our comparing designs which are in some respects not easily comparable, and our adjudicating on productions which we find it difficult to approach without some tinge of prejudice.

After much deliberation and careful consideration of all the circumstances and particulars of the conditions under which the invitation was issued, we have agreed on the following recommendations:—

We place No. 26 first (by Mr. Henry T. Hare). The author has dealt with the plan in a simple and ingenious way, and has overcome the difficulty with skill of treating the various street corners. The main lines of the setting out as originally approved by the Committee are not materially departed from. Drury Lane and the corresponding street on the east side of the new road are shown to be arched over. Perhaps it may be considered that this would not be admissible, but it adds much to the artistic treatment of that façade. The architect of this design has dealt with the Strand front as devoted to a public building, but he shows a thorough appreciation of artistically adapting other portions of the improvement to commercial purposes. On the whole, the treatment is such that the Committee might reasonably expect lessees to carry out designs not inferior to these in point of cost.

We place No. 27 second (by Mr. William Flockhart). This architect deals with the commercial adaptation of the design quite as literally as No. 26. It is much to be regretted that he has adopted a decidedly French bias, as there is much skill and artistic feeling in the drawings, and we feel that if he had kept within the traditions of English Renaissance the result would have been much better suited to the grand site which is intended to be treated, but the skill and power shown in the design cannot be set aside on that account, as style was evidently not intended to govern the issue. This design would probably be more economically carried out than No. 26, and therefore has, under that head, claims to attention, but we repeat the regrets that the influence of French architecture has been so perceptible in a design which is intended for one of the finest sites in the British capital.

We place the design of No. 20 third (by Mr. Mervyn Macartney). In its artistic value it is very unequal. The arrangement on the plan for a circus at the south end of the new street to Holborn is a simple and dignified suggestion. The elevations for the north side of the curved streets are, however, feeble, but this appears rather to be due to the poorness of the drawings. Other portions of the design, especially the alternative design for a public building, possess great dignity, and show scholarly perception of the importance of the site. It would, however, probably be more costly to carry out than No. 26. It may practically be considered the most expensive of the three.

We desire also to offer a word of comment on the very carefully thought-out block plan of No. 29 (by Mr. Leonard Stokes), but the proposed emendations are on the whole not an improvement on the simple treatment of the Council's property suggested in the other designs, though the Somerset House extension is a conception which, if properly worked out, would add great dignity to the scheme.

It must be borne in mind that all the designs are little more than preliminary studies. We do not see how it is possible to suppose that they can be in any sense fully matured, as the governing conditions of plan, which are so helpful in designing elevations, are necessarily absent at this stage, and in selecting the above-mentioned designs we have been largely influenced by a feeling that they possess elements capable of being developed into works of great excellence.

At the Huddersfield Infirmary a new wing has been erected. Mr. B. Stocks is the architect.

In the Parish Church of Llantwit Major, South Wales, the Ecclesiastical Commissioners have recently placed choir stalls and priest's desk. The new work has been carried out entirely in English oak by Mr. W. Dark, Ecclesiastical Art Works, Crediton, from designs by Mr. W. D. Caröe, architect to the Commissioners.

A New Wesleyan Church and Schools at Milford Haven have been erected at a cost of £4,650 in Priory Road. The architect was Mr. John Wills, of Derby, and the contractors were Messrs. S. Fred Couzens & Co., Cardiff. The style is Early Gothic, and local stone facings and Bath-stone dressings have been used, while the joinery is of pitch-pine throughout. There are vestries, assembly hall, classrooms and church parlour.

R.I.B.A. COUNCIL.

THE following is the constitution of the new Council of the Royal Institute of British Architects (the order of the names is according to the votes received):—

President.—Aston Webb, A.R.A., F.S.A.

Vice-Presidents.—John Belcher, A.R.A., T. E. Colclutt, Alfred Darbyshire, John Slater, B.A.

Hon. Secretary.—Alexander Graham, F.S.A.

Members of Council.—Ernest George, E. W. Mountford, J. A. Gotch, F.S.A., Leonard Stokes, G. F. Bodley, R.A., F.S.A., Professor Beresford Pite, W. D. Caröe, M.A., F.S.A., E. A. Gruning, Paul Waterhouse, M.A., F. T. Baggallay, John J. Burnet, A.R.S.A., G. H. Fellowes Prynne, J. S. Gibson, R. Phené Spiers, F.S.A., W. Milner Fawcett, M.A., F.S.A., W. H. Seth-Smith, E. T. Hall, G. E. Grayson.

Associate Members of Council.—H. V. Lanchester, R. S. Balfour, E. W. Wimperis, W. J. N. Millard.

Representatives of Allied Societies.—A. Harrison (Birmingham Architectural Association), E. W. M. Corbett (Cardiff, South Wales and Monmouthshire Architects' Society), G. C. Ashlin, R.H.A. (Royal Institute of Architects of Ireland), A. Wakerley (Leicester and Leicestershire Society of Architects), Frank Caws (Northern Architectural Association), Butler Wilson (Leeds and Yorkshire Architectural Society), C. H. Channon (York Architectural Society), H. G. Luff (Devon and Exeter Architectural Society).

Representative of the Architectural Association.—Henry T. Hare.

Auditors.—Louis Ambler, H. S. East.

Masters and Men.

Plasterers' Strike at Merthyr.—The adjourned conference between the Merthyr builders and the plasterers on Wednesday last resulted in the narrowing down of the points at issue, and settlement seems almost assured. The employers were not agreeable to withdraw their three months' notice, but were willing to extend the period considerably.

The Bristol Dispute.—A letter received by the Bristol Master-Builders' Association from the Operative Masons Society states that the offer of the masters to refer the question in dispute to conciliation through the medium of the Board of Trade has been considered and declined. The operatives believe that a settlement could best be arrived at by negotiations between the two associations without the assistance of a third party.

The Monthly Report of the Amalgamated Society of Carpenters and Joiners shows a further reduction in the unemployed list, which is now just over 2 per cent. throughout the organisation and about 3½ per cent. in the Manchester district. It may be added that the advisability of amalgamating the three principal carpenters' and joiners' societies—the Amalgamated, the General, and the Associated—is under consideration, and there are hopes in some quarters that more success may attend the present proposals than in the case of previous suggestions of amalgamation.

Labour in May.—The Labour Department of the Board of Trade reports that employment in May showed little change on the whole as compared with April. Employment in the building trades generally shows some improvement as compared with April, but is not quite so good as in May of last year. The percentage of unemployed union members among carpenters at the end of May was 2.5, compared with 3.0 at the end of April and 2.9 for May, 1901. The plumbers returned 6 per cent. as unemployed at the end of May as compared with 5.6 per cent. in April and 5.4 per cent. in May, 1901. Twenty-three fresh disputes began in May, involving 7,385 workpeople, of whom 6,623 were directly and 762 indirectly affected. Of the new disputes in May, 1902, seven took place in the building trades, and three in the metal, engineering and shipbuilding trades. Of the twenty-one new and old disputes, affecting 11,818 workpeople, of which definite results were reported, five were decided in favour of the workpeople, ten in favour of the employers and six were compromised.

Keystones.

A New Mission Hall at Shieldfield is being erected in connection with the Clarence Street Mission. Mr. J. Walton Taylor is the architect, and Mr. James Lunn the contractor.

Another Carnegie Library.—Mr. Carnegie is giving £7,500 for the erection of a free public library building on condition that the town provides the site.

The Empress Club, London.—Messrs. Wimperis & Arber are the architects of the elevation of this club in Dover street, not "Wimperis & East" as stated on p. 240 of our issue for June 4th.

A New Petty Sessions Court at Caerphilly was opened recently at a cost of £2,000. The new buildings are really extensions. Externally, the building is finished with cement with grey and red Forest stone windows. The glazing is of leaded lights. Messrs. Price Brothers, of Pontcanna Road, Cardiff, were the contractors, and the architect was Mr. T. Lloyd Edwards, county surveyor, Bridgend.

A Statue of General Gordon is proposed to be placed in St. Martin's Place during this season. The statue is a replica of Mr. Onslow Ford's statue of General Gordon seated on a camel, and will be placed in Khartoum. The Westminster City Council have agreed to allow this, subject to the approval of his Majesty's Office of Works and to the exact site of the statue being approved by the City engineer.

At Winkleigh Church a new chancel has been erected. The church in 1873 underwent a thorough restoration at the expense of nearly £7,000, but the chancel was not then completed. The Ecclesiastical Commissioners, however, repaired it later. To an extent the chancel roof, although good, had for years been somewhat offensive to the sight; consequently, steps were taken to remedy this. Mr. G. Fellowes Prynne, of London, was the architect. The chancel comprises a floor of black and white marble, marble steps to the Communion table, teak panelling, with shields bearing emblems, and a new roof in oak, ornamented in gold, with emblems on the bosses. The cost of this work is about £700.

A New English Presbyterian Church at Holywell is being erected in Whitford Street, and is estimated to cost £3,000. The architect is Mr. T. G. Williams, Cable Street, Liverpool; and Mr. Richard Jones, of Holywell, is the builder. The new chapel will be in the Gothic style and will afford accommodation for about 250 persons. The front will be of red Ruabon bricks, relieved by dressings of terra-cotta and local stone. There will be a square tower to the left of the front elevation, tapering into an octagon above. A schoolroom, vestry, &c., are to be provided at the back. The windows will have cathedral lead lights in neutral tints. The roof will be supported on hammer-beam principals, resting on stone corbels. The interior fittings will be of pitch-pine.

A New Episcopal Church at Bieldside is being erected from plans by Mr. Arthur Clyne, F.R.I.B.A., Aberdeen. The style of the building is Gothic, with Scottish features. The masonry will be a combination of red and grey granites from Hill of Fare and Rubislaw Quarries respectively. The surface of the stones for the most part will be left quite rough, almost as they come from the quarry. The principal dimensions of the building are as follows:—Total length internally, 89ft.; width of nave and chancel, 23ft.; width across transepts, 53ft.; height from floor to apex of barrel-vaulted ceiling, 34ft.; height from ground level to ridge of roof, 49ft.; height of bell tower, 78ft. The church will accommodate about 250, and provision has been made in the design for extension if desired, the addition of a north aisle and transept increasing the total accommodation to about 350 sittings. The estimated cost of the building is about £3,000. Mr. Frank Morrison, Culter, has the contract for the masonwork, and for the other departments the contractors are as follows:—Carpenter work, Messrs. Hendry & Keith, Aberdeen; plumber, Messrs. Blaikie & Sons, Aberdeen; slater, Mr. A. E. Merson, Aberdeen; plaster, Mr. A. Stephen, Aberdeen; painter and glazier, Mr. E. Copland, Aberdeen.

A New Church Hall at Nottingham for the parish of St. Stephens is being erected in Gladstone Street, Radford Road, at a cost of about £2,200. The architect is Mr. Hedley J. Price, A.R.I.B.A., Nottingham, the builder being Mr. Thomas Long, of Nottingham. The structure is to be built of red bricks with stone facings.

Mr. Ernest Woodhouse, architect, 88, Mosley Street, Manchester, has been appointed by Mr. C. H. Wordingham, M.I.C.E., M.I.M.E., M.I.E.E., consulting engineer, Manchester, to carry out the architectural work in connection with the proposed new electrical station for the Stretford Urban District Council.

The Institute Room at 9, Conduit Street, W., is now lighted under a new scheme devised and carried out under the superintendence of Mr. John Slater and Mr. Edwin T. Hall. With the exception of those around the dome, all the lights are concealed in large saucer-shaped copper bowls hung from the ceiling, whence the light is pleasantly diffused over the room.

"Groote Schuur."—Mistakes are often made in the spelling of the name of the well-known property bequeathed by the late Mr. Rhodes as an official residence for the future Prime Ministers of a federated South Africa. The Dutch word "schuur," meaning "barn" or "granary," is a feminine noun, and the qualifying adjective "groot," meaning "great," should have the ending "e" appended to it. To write or speak of "Groot Schuur" is as incorrect as it would be in Latin to use an adjective ending in "um" with a feminine noun.

A New Hospital for Infectious Diseases at East Boldon has been erected for the South Shields Rural District Council. The buildings consist of an administrative block, a caretaker's lodge in front, a ward block, isolation block, discharging block, laundry block, mortuary and ambulance house, stables and offices. The total cost, including site, erection of buildings, laying-out of grounds, making roads and fencing, &c., is about £8,800. The total available accommodation at present is sixteen beds. Mr. J. H. Morton, F.R.I.B.A., South Shields, was the architect, and the builder Mr. W. D. Allison, of Whitburn. The roadmaking has been in the hands of the council's highway surveyor, Mr. E. Clarkson.

The New Roman Catholic Church at Lowestoft, which has just been opened, consists of a lofty nave with clearstory supported on pointed arches and red granite columns, aisles, sacarium, lady chapel, morning chapel, sacristy and confessional. Boldly-moulded stone arches separate the sacarium and chapels from the other parts. An elaborate stone and marble high altar is erected in the sacarium, with five traceried two-light windows behind. There are three entrances in front, and a massive square tower above the angle of the front, having a staircase turret. There is a five-light tracery window in the front gable. The church is faced with red bricks, with Costessey dressings. It is Decorated Gothic in style, and has cost about £7,900 exclusive of seating. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 4, Clement's Inn, London, and F. W. Richards, 14, Stanley Street, Lowestoft. The works have been carried out by Mr. G. E. Hewes, of Norwich.

A New Bank at Douglas, I.M., has been erected for the Isle of Man Banking Co., Ltd., at the corner of Athol Street and Prospect Hill. It is built of polished Aberdeen granite, and is in Italian Renaissance style. Mr. A. Marshall Mackenzie, A.R.S.A., F.R.I.B.A., was the architect, and Mr. Robert F. Douglas, of Brunswick Road, Douglas, the contractor. The following local firms were the sub-contractors:—Messrs. Skelly & Caren, masons; Messrs. Christian & Faragher, plasterers; Mr. R. W. Creer, marble mason; Messrs. Sherwood & Co., plumbers; Mr. Robert Knox, ironwork; Mr. E. Henry, painter; and Messrs. E. Wade & Sons, ornamental plasterwork. The granite facings were supplied and dressed by Mr. John Morgan, Aberdeen. The glass and leaded lights are by Messrs. Williams & Watson, Liverpool; and the strong room and safes are by Messrs. Milner, Ltd., Liverpool. The hydraulic lift was furnished by Messrs. Pickering & Sons, Stockton-on-Tees. The St. Pancras Ironworks Co., of London, supplied the prismatic pavement lights.

The Ancient Jacobean Cloth Hall at Newbury, with its curious carvings, is being restored and converted into a museum of local antiquities and an art gallery, as the town memorial of Queen Victoria, at a cost of about £2,000.

Sir W. B. Richmond, B.A., at a meeting of the Ruskin Union, held last week, gave a lecture on "Ruskin, as I knew him and as he impressed me." It was longer ago, he said, than he could definitely remember that he first saw John Ruskin at the house of his (the lecturer's) father, who met him in 1838. Ruskin contracted a close friendship with the family. His masterful and engaging personality, so magnetic and stimulating, acting on the minds of children, could not fail to impress on them an indelible stamp. Whether one agreed with all the master thought or not, his influence on one's mind stuck fast, and inspired the desire for beauty, not only in art but in life. He suggested that the Ruskin Union would do well to organise an exhibition of Ruskin's works, with the object of promoting a knowledge of the master's many-sided genius.

The Acoustics of Westminster Cathedral.—With the object of testing its acoustic properties, a concert was held last week in the new cathedral at Westminster. Acoustic defects were apparent, but this may be due to the unfinished state of the structure. More than once in the choral music a mild form of cacophony was produced, apparently by the prolonged vibration of certain tones which the choristers had ceased to sing; and the tone of the strings, especially in the performance of Beethoven's C minor Symphony, was now and then to be followed only with some difficulty from the same cause. It may be that the effect will be much improved when the Cathedral choir are placed in their proper home, instead of, as on this occasion, in the Sanctuary itself. Since they were where they were, and not where they will ultimately be, the test was hardly a proper one. Never heless, many remarkably beautiful effects were obtained, especially by the choirs.

New County Council Chamber and Offices have been erected at Newport, Mon., at a cost of £10,000 on a site adjacent to the present offices and the county police premises at Pentonville. The style of the building is Renaissance, and the materials used in the facade, which is 80ft. in length, is Pennant stone, with Greenshill dressings. The council-chamber is modelled on the style of the Westminster County Council's Chamber, being octagonal in shape, 36ft. by 36ft. and 26ft. in height. All the members' seats face the chair. There is a strangers' gallery. There is an electric fan in the turret to ventilate the chamber, which is lighted by electricity. There is also a members' room, chairman's private room, two committee-rooms and rooms for the clerk of the peace, also for the chief clerk and other officials, with two strong rooms below. Messrs. Waring, of London, had the contract for the furnishing of the council-chamber, and Messrs. Reynolds, of Newport, for the offices and committee-rooms. Mr. D. W. Richards, of Newport, was the builder, and Mr. W. Tanner, county surveyor, the architect.

An Isolation Hospital at Kirkburton is proposed to be erected, and a Local Government Board enquiry was held last week into the application to borrow £9,696 for the purpose. Mr. J. Berry is the architect. The hospital will consist of five blocks, namely, administration and discharging rooms, scarlet fever pavilion; isolation block; laundry, disinfecting rooms, stable, ambulance shed and mortuary; and porter's lodge. The administrative block will contain on the ground floor a medical superintendent's room, matron's room, nurses' dining-room, waiting-room, lavatory, w.c., store-rooms, kitchen, scullery, pantry, coal-place. The discharging rooms will consist of bath- and dressing-rooms. On the first floor there will be seven bedrooms, bathroom, w.c. and linen store; and on the basement floor keeping cellar. The scarlet fever pavilion will contain in the female wards eight beds, female separation ward two beds, male ward six beds, male separation ward two beds. The nurses' duty room and bathroom are placed in the centre of the building. The isolation block contains two two-bed wards, two single-bed wards, and two nurses' duty-rooms.

Engineering Notes.

The New Isolation Hospital, Chadwell Heath, has been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent Manchester grates.

At the Colonial Office, in preparation for the Coronation, extensive alterations and improvements have been made, and included in these is a Waygood electric lift of the very latest pattern.

Cholmondeley Castle—The warming and hot-water supply of Cholmondeley Castle have been placed in the hands of Messrs. John King, Ltd., engineers, Liverpool, who are employing their "Rahnee" radiators in the Great Hall and principal apartments.

The Glasgow Corporation Tramways Department, in its report of last year's operations, states that the earnings amounted to £612,794 as compared with £484,872 for the previous year, while no fewer than 163,600,000 passengers were carried, being an increase of a little over 31,000,000.

A New Dock for Belfast.—In view of the possible increase in the shipbuilding industry in Belfast, in consequence of the shipping combine agreement with Messrs. Harland & Wolff, the Belfast Harbour Board decided last week to construct a graving dock 800ft. long at the estimated cost of £299,000.

An Eiffel Tower for Rhyl.—The proprietors of the new arcade and ballroom, which is being erected by the firm who carried out the Blackpool Tower undertaking, have decided to deviate from their original plan of erecting a central dome and erect in its place an Eiffel Tower to a height of 140ft. The turret will contain an electric searchlight of 20,000 candle-power. Steel is to be used in the construction of the tower, which will be circular in design and contain in its base a model Continental village. The top will be reached by an electric lift from the ballroom balcony bridge.

Mr. James Shand, of London, who died on June 10th, was born in Edinburgh in 1823, where he acquired a varied knowledge of mechanical engineering as a pupil of James Slight, engineer to the Highland and Agricultural Society of Scotland. His successful management of the business of W. J. Tilley, fire-engine maker and hydraulic engineer, of Blackfriars Road, London, whom he joined in 1845, led to his taking the senior position in the firm of Shand & Mason (now Shand, Mason & Co.), formed on the retirement of Mr. Tilley at the end of 1850. Although his earliest efforts were directed to the improvement of the manual fire-engine, Mr. Shand was best known in connection with his successful efforts in bringing the steam fire-engine to its present state of practical utility. Mr. Shand's most prominent contributions to the development of the fire-engine were the inclined water-tube boiler with cylindrical tube box, with which steam of 100lb. is raised in six minutes, and the treble cylinder direct-acting steam pump. In 1857 he was elected an associate of the Institution of Civil Engineers, and in 1874 was transferred to the class of members. He retired from business at the end of 1891.

CONDITIONS OF COMPETITION.

At the last meeting of the Royal Institute of British Architects the following alterations proposed by the Council to be made in the Institute "Suggestions for the Conduct of Architectural Competitions" were approved:—

To be inserted as the second paragraph in clause 1:—The selection of an assessor should be made with the greatest possible care, as the successful result of the competition will depend very largely upon his experience and ability.

Clause 4 to be amended so as to read as follows:—The number, scale and method of finishing the required drawings should be distinctly set forth, and they should not be more in number, nor to a larger scale, than necessary to clearly explain the design. If the assessor advises that perspective drawings are desirable, it should be so stated; and such drawings should be uniform in size, number, mode of colouring, mounting, &c.

In clause 2 the words "after conference with the promoters" were added after the words "The duty of assessors should be."

With reference to clause 1, an amendment was carried that it be referred to the Council to consider the effect of the omission of the words, "and whose decision should govern the selection of the designs."

It was agreed to add the following to clause 12, with the exception that the Council was asked to consider whether the expression "breach of faith" was not too strong, and whether the words "might constitute a breach of faith" would not be better:—It is important that the award of the assessor should be adhered to, unless there is some valid objection to the employment of the author of the selected design to carry out the work, as to which the assessor is satisfied. The setting aside of the assessor's award for any other reason constitutes a breach of faith on the part of the promoters.

THE CRYSTAL PALACE.

The Water System and the New Roof.

THE members and associates of the Society of Engineers recently paid a visit to the pumping stations and works connected with the water system of the Crystal Palace and inspected the new roof over the centre transept.

The ordinary amount of water requisite for the needs of the Crystal Palace varies between 250,000 gals. and 300,000 gals. per day throughout the year. This is enough—at 30 gals. per head—for the supply of a town of from 8,000 to 10,000 inhabitants. This amount leaves out of account altogether any which may be used for drinking purposes. Such water is obtained from another source than that from which the general supply is drawn. For the most part the Crystal Palace depends for its water supply upon the amount of rainfall collected from its grounds—nearly 200 acres, including the roofs, are available as catchment area—and supposing a rainfall of 25in. a year, which is the amount calculated by the authorities, the total rainfall is over 117 million gals. Of course, only a proportion of this is caught, and the actual amount used is about 90 million gals. Some is used twice over, so that the actual amount of water in circulation is less than this. In dry years the supply is not equal to the demand, and the mains of the Lambeth Water Company are drawn upon.

The drainings from nearly all the land within the Palace boundaries falls by gravitation to the boating lake, which forms the main storage reservoir. Its area is about 5½ acres, and its depth varies from 6ft. to 9ft. Its surface is, at an average, 155ft. below the mean level on which the Palace itself is built. The tanks in the towers come about 280ft. above this again, a total difference of, say, 435ft. The fall of 155ft. takes place in a distance of 800yds. In order that it can be utilised, however, it is necessary that the water should be raised to a height from which it can command every part of the grounds and buildings. Placed on the top of each of the towers is a large circular storage tank. These are 47ft. in diameter, and they are provided with inverted funnel-shaped bottoms. The capacity of each is, with a depth of 35ft., about 290,000 gals. Some idea of the strength of these towers can be obtained by considering what this volume represents in weight—it is nearly 1,300 tons. The water in these tanks is devoted almost entirely to reserve in case of fire, though some of it is used for blowing the bellows of the great organ and some for actuating hydraulic lifts. The tanks are joined by two separate 8in. cast-iron mains, to which fifty hydrants are attached. The water in the two tanks, therefore, always stands at the same level, since there is open communication between the two; and in them there is therefore a possible storage of nearly 600,000 gals. The water is always at a pressure of about 120lb. at the floor level of the Palace. At a height of about 80ft. above the level of the ground near the bottom of the north tower are two storage tanks. Each is 48ft. square by 16ft. deep, and together they can hold 460,800 gals.; the pressure of the water from these tanks is about 35lb. per sq. in. A 15in. main leads from them through the

building, where the water is used for general purposes. At the foot of the north tower is an irregular-shaped storage reservoir capable of holding 5½ million gals. The water from this reservoir can be pumped into the lower-level tanks, or into those in the tower, and it is also available for the fountains, but not, of course for the buildings, since its level is too low. It is, however, 50ft. above the highest fountain and 12ft. above the lowest. There is yet another source of water supply at the lower pumping station, where there is a well sunk till it meets with water-bearing green sand at a depth of 300ft. and chalk at 360ft. below the surface. Its total depth is about 250ft., but three bore-holes 10in. in diameter are sunk from the bottom of the well to a further depth of 250ft., making the total depth to the bottom of the bore-holes 500ft. The bore-holes are cast-iron lined down to the green sand. The well is brick-lined for its full depth of 250ft. and is 8ft. 6in. in diameter. At a depth of about 150ft. is a set of three-throw pumps made by Hunter & English. The delivery from these is 4in. in diameter. The ordinary water level in the well is at a depth of 95ft. from the surface, and the totals of the lifts to the reservoir and the tanks are respectively 268ft. and 350ft. The yield of the well is about 40,000 gals. a day. The pumping machinery employed is of an antiquated pattern, and most of it dates from the earliest days of the Crystal Palace at Sydenham.

The overflow, which in times of heavy rain takes place from the boating lake and cooling pond, is led away by a culvert which passes out of the Palace grounds near the Penge entrance, and eventually finds its way into the Ravensbourne. A certain amount of the water, when it has been used for general purposes in the grounds, eventually finds its way back to the boating lake, and the cycle of operations is repeated. The greater part, however, is lost by evaporation, absorption into the ground, or by being delivered into the sewers of the main culvert.

The Centre Transept Roof.

In 1854 the Great Exhibition building of 1851 was reconstructed on the Norwood Hills at Sydenham as the well-known Crystal Palace. The glass roofing, of which there is about 14 acres, is on the ridge and furrow system of Sir Joseph Paxton, the designer of the original Exhibition building. The glass was placed in position upon the main framework of the roof by the alternate fixing of glass and sash bar, the latter resting upon the ridge timber at the upper end and upon the Paxton gutter at the lower. The glass was pressed home into grooves formed on either side of the sash bars, which were coated with paint immediately before the glass was placed in position, the paint successfully taking the place of putty. The maintenance of this roof in efficient repair proving a source of considerable expense to the Crystal Palace Company, it was resolved, about three years ago, to re-glaze the whole of the roofs, commencing with the great arch over the centre transept of the Palace, upon the "Eclipse" principle of Messrs. Mellowes & Co., of London and Sheffield. To this end the iron main framing of the roof was left unaltered, but the old Paxton gutters and ridges were removed and replaced by new ones of wood covered with lead. The sash bars consist of light T-steel, entirely encased in a drawn coating of lead with an admixture of tin. These bars spring from gutter to ridge, in place of the old timber sash bars, the lead being drawn with projecting strips on either side for embracing the edges of the glass. The sheets of glass used measure 51in. by 18in., instead of 19in. by 10in. as formerly, and the weight is 26oz. per sq. ft., with 31oz. glass on the crown instead of 16oz. and 21oz. In fixing the new glass neither putty nor paint has been used, and none will be required in maintaining the roof, the glazed area of which is about 2 acres. The lantern which surmounted the old roof was removed, and the new roof is completely semi-circular. There is now practically no external surface which will require painting, and should any glass need replacing it can be done with a minimum of trouble and expense. The cost of maintenance is thus greatly reduced, especially when the comparative inaccessibility of the roof is taken into consideration.

Views & Reviews.

Cairo.

The old writer says that he who hath not seen Cairo hath not seen the world: "her houses are palaces and her air is soft with an odour above aloes, refreshing the heart." A comparison between the old and the new in that city of gems will furnish contrasts of a peculiar nature, some in accord with and others strangely different from the Eastern poet's eulogy: for there are two Cairos, the European and the Egyptian, and two kinds of mind are there—the modern, which regards the British civil changes with admiration, and the truly Cairene mind that looks back longingly to the glorious days of the Mamlûks, hating all innovations, whether they be patent traps or other godless improvements in the mosques, two-horsed 'arabiyas that splash the Faithful with mud, trams, bicycles or other abominations. Whatever may be the opinion on these matters, admiration for the mosques and other buildings of Cairo is universal: and it is to clothe the vestiges of the mediæval city that the author of this book devotes himself. How great an interest this adds is shown in these pages, for the many ruined courts and crumbling arcades lose much in meaning until their story is revealed. A few streets away from the European quarters, in an area of dilapidated houses which nobody thinks of repairing, one may picture the moving histories of the Thousand and One Nights, but in the mosques and colleges and scanty remnants of palaces we find even more to carry the mind back to the golden age of Arabian art and culture: for here are "the purest examples of Saracenic architecture that can be seen in all the once wide empire of Islam. Damascus and Ispahan, Agra and Delhi, Cordova and Granada, Brusa and Constantinople, possess elements of beauty and features of style which Cairo has not, and they enlarge and complete our understanding of Arab art; but to view that art in its purity, uncorrupted by the mechanical detail of the Alhambra, unspoilt by the over-elaboration of Delhi, we must study the mosques and tombs of Cairo." We are thankful for the buildings that remain, but what a record of devastation and spoliation the city presents! Perhaps

the worst was done under the French, when the Boulevard Mohammad 'Aly—"that unspeakable atrocity"—was cut through some of the most beautiful quarters, and a noble mosque chopped in half to preserve the straightness of the street: while the buildings that sprung up on either side are mean and uneven offices, neither Europeanly regular nor Orientally picturesque. Architecture was well treated by the beys and pashas during the three centuries of Turkish rule: it was not till Mohammad 'Aly's foundation of a virtually independent dynasty in 1805 that the era of destruction began, succeeded by the Europeanising movement that brought about the demolition of a large number of mosques and other historic buildings which impeded carriage traffic or stood in the way of new streets and squares "which the viceroys of Egypt planned with little or no regard to existing antiquities." That even more demolition was not carried out is due to the Commission for the Preservation of the Monuments of Arab Art: and it is gratifying to know that during the last five years, under Lord Cromer's influence, the Commission has been enabled to undertake very comprehensive works of scientific preservation under the direction of their chief architect, Herz Bey. The author of this book says: "I can state with confidence that, comparing the general state of the mosques in 1883 and 1895, they are in a far safer and better preserved condition now than they were twelve years ago. . . . When a monument cannot be preserved, such fragments of ornament or inscriptions as remain are carefully gathered and transported to the Arab Museum, which itself is evidence of the good work that has been done in the past twenty years. These years have indeed been fruitful in serious labour to repair the injury which natural decay, and unnatural confiscation, neglect and vandalism have worked in the past upon the relics of mediæval Cairo."

At the south-eastern extremity of Cairo, on a spur of the rocky range of Mokattam, stands the Citadel, 250ft. above the city. At this height the European note is too small to affect the Oriental tone—"Countless domes and minarets, a glimpse of arched cloisters, a wilderness of flat-roofed houses, yellow and white and brown . . . a patch of green here and there . . . and beyond, a fringe of palms and a streak of silver where 'the long bright river' rolls sleepily on between its brown banks: while in the distance, against the ridge of the Libyan horizon, in the carmine glory of the sinking sun, stand the everlasting pyramids, 'like the boundary stones of the mighty waste, the Egyptian land of shades.'"



WITHIN THE MOSQUE OF IBN-TULÛN.

The scores of mosques in Cairo need volumes to themselves, and it is not possible here to give anything more than a few notes on some of them. The mosque of Ibn-Tulûn is an architectural landmark. First, it was built entirely of new materials instead of the spoils of old churches and temples, and it is the earliest instance of the use of the pointed arch throughout a building, earlier by at least two centuries than any in England. Ibn-Tulûn was first in difficulty as to how to obtain the three hundred columns needed to support the arcades, but his architect said he would build a mosque without them. Skins were brought and he drew the plan. It was quite an innovation, but Ahmad saw its merits at once, arrayed the designer in a robe of honour and gave him 10,000 dinars to carry out his plan. When it was done he gave him 10,000 more. "The adoption of the new plan of brick piers, instead of columns, led to the employment of the pointed arch, and the exclusion of marble suggested the plaster or stucco decoration which still preserves its original admirable designs." The mosque of Sultan Hasan is another notable example, built between 1356 and 1359. It includes most of the characteristics of the Nasirî epoch and displays them on the grandest scale. The story goes that the Sultan was so charmed with the design that he cut off the architect's hand lest he should repeat his success! The prevailing impression is one of great height, the walls reaching to 113ft.; they are built of fine cut stone from the pyramids and have moreover the peculiarity, rare in Saracenic architecture, of springing from a socle. This mosque suffered greatly from cannon and musketry during the Mamlûk period. It was once closed for half a century, and about 1450 it was even used to support a tight-rope stretched to the Citadel on which a European gymnast disported himself to the tremulous delight of the people.

The word "mosque" really means a place of worship, and the buildings which everyone calls "mosques" are really colleges, *medresas*, built for the purpose of theological training. The old mosques had no external decoration, but those of the Mamlûk period (copied no doubt from Palestine) generally present facades with sunken panels, portals in recess and a decorative cornice. The next characteristic is the development of the minaret, and then the construction of large domes. From the plain dome with a



GATEWAY OF SULTAN HASAN'S MOSQUE, CAIRO.

small cupola on top comes the fluted dome, and next the dome covered with ornament, chevrons, arabesques or geometrical *entrelacs*, all chiselled in the stone: the elaborate ornament culminating in the work of the Circassian sultans of the fifteenth century.

To the many other buildings which are dealt with in this book we cannot now refer; but, in conclusion, we would quote the following passage relating to the artistic work of mediæval Cairo: "The Saracens brought no art with them They learned their arts from their foreign subjects, yet invariably introduced an element of differentiation which marks their work as characteristically Saracenic. They learned their metal-chasing from Persia, but they soon made it their own; they copied Byzantine and Coptic wood-carving, and added the essential personal equation which constitutes a distinct art; they found glass making and blowing in Egypt, acquired the secrets of enamelling and gilding from Constantinople, and then produced a style of enamelled lamps totally unlike any other in the world."

This book is a fascinating one to read, especially to the student of architecture. The author combines a descriptive talent with accuracy in detail, and the manner in which he sets before one's eyes the changing pictures of the city's development combines the greatest interest with continual instruction. The book is illustrated with numerous drawings in line and wash, but it is to be regretted that the former are not better specimens of draughtsmanship: by far the best of them is that which we now reproduce.

"The Story of Cairo," by Stanley Lane-Poole, Litt D., M.A., Professor of Arabic at Trinity College, Dublin. London: J. M. Dent & Co., 29 and 30, Bedford Street, Strand. Price 4s. 6d.

The Municipal Engineer.

This is a book of elementary generalizations. It will give the student some idea of what is included in municipal engineering and sanitation, but will not make him much wiser on the respective merits of the various methods adopted, while for the practising engineer the book is useless. Street-paving, water-supply, sewage-disposal, cemeteries, baths, and matters of a kindred nature are touched upon, but there is a dearth of practical, concise details, no definite selection among what is commendable and what is not. The book is one of "The Citizen's Library," and may suit the needs of the lay reader. To anyone in the profession, however, it supplies little information of practical utility.

"Municipal Engineering and Sanitation" by M. N. Baker, Ph.B., O.E. New York: The Macmillan Co. Price 4s. 6d. net.

Modern Forms of Architecture.

This is a collection of architectural designs of various sorts intended to forward the movement of introducing "a new note into one of the oldest of the arts." Artists of many nationalities participate in the programme, and "from cellar gratings to roof pinnacles every detail of public and private buildings will be repeatedly treated, equal regard being given to the most simple and the most elaborate requirements." With the first number before us we reflect on the remark that the drawings are the more valuable because they are not created under the hampering restrictions of the contractor. What the future has in store we cannot say: but it will surely not surpass the design for a house by Leopold Bauer, a mad creation from top to bottom. This and some atrocious designs for folding glass doors are perhaps the worst examples in the publication. Mr. Ashbee is represented by sketch designs for two garden seats, and very sane work it is when compared with some of the other examples. We are quite in sympathy with any genuine, unaffected, reasonable endeavour to loosen the shackles of the past and produce architectural forms which are essentially modern, of our own time, and for our own particular uses: but when designers throw all sense to the winds, and degenerate into madcaps, we can hardly be expected to admire their works: for they are devoid of fitness and beauty. And yet one finds in these strange creations details of decoration which are very pleasing. There are a few in this series of plates. They are glimpses of what might be really beautiful schemes of design, and

one regrets that the remainder of the work is so different. "Modern Forms of Architecture" will be published in monthly parts, each comprising eight plates printed in colours.

"Modern Forms of Architecture: Vol. I," edited by M. J. Grady, R. Beauchamp and A. F. Phillips. London: "The Art Record" Press, 144, Fleet Street, E.C. Price 2s. nett.

The Building Trades Directory.

This is the ninth edition of the Building Trades Directory, and it contains nearly 200 pages more than the last issue. The names in the principal towns in the Channel Islands are given—a valuable new feature—and the various other lists have been added to, so that the book is made still more complete. Many interesting facts about the building trade are given in the short preface. The figures show a considerable increase in the importation of all kinds of timber into this country, especially fir timber. During 1900 the quantity of stone, marble and slate imported from abroad amounted to almost a million tons, nearly 350,000 tons having come from the Channel Islands. Giving as it does the names and addresses of all those in any way connected with architecture and building throughout England, Scotland and Wales, the principal towns in Ireland, the Channel Islands and the Isle of Man, this directory is of the greatest use to builders, architects and others. The methods adopted make reference easy, and, so far as accuracy is concerned, it is well to mention that the whole of the names have been personally checked by a large staff of canvassers and their returns afterwards arranged by a staff of clerks specially trained to the work.

"Kelly's Directory of the Building Trades, 1902." London: Kelly's Directories, Ltd., 183, 183 and 184, High Holborn, W.C. Price 30s.

The Older and the Newer London.

The London Topographical Society has only been in existence for three years, but it has all the prestige which many distinguished names can give to it. For president it has the Earl of Rosebery; Lord Welby is one of its vice-presidents; while its council includes such well-known men as Lord Belhaven and Stenton, the Viscount Dillon, Mr. Alexander Graham, F.S.A., Prof. W. R. Lethaby, Mr. Henry B. Wheatley, F.S.A., and Mr. Philip Norman, F.S.A.

The Society was founded for the publication of material illustrating the history and topography of the City and County of London from the earliest times to the present day, this being effected by the reproduction of maps, plans, &c., by the publication of documents and data of every description, and the issuing of an annual record of demolitions and topographical changes.

The volume now under notice is the first of a series of year-books to be published, but in future the record of demolitions, discoveries and changes of antiquarian and archaeological interest in London will be greatly improved and made more complete, while a commentary on the maps, views and plans reproduced by the Society will add another feature of interest. In this first annual record are illustrations and records of the mediæval remains found at Blackfriars in 1900, of the changes effected around the now demolished Holywell Street, and the Strand improvement: in addition to which are given the annual addresses delivered by Lord Welby and Mr. Wheatley, notes on Knightsbridge, Kensington Palace and Lincoln's Inn Fields, reports of the proceedings of the Society, and a list of illustrations of buildings demolished or threatened with demolition during 1900.

Some extracts from Disraeli's "Tancred" are given as a preface to the articles on "The Strand Improvement." Disraeli was bitter against Parliament and its Building Act, to which were due the Gloucester Places and Baker Streets, and Harley Streets, and Wimpole Streets, "and all those flat, dull, spiritless streets, all resembling each other, like a large family of plain children, with Portland Place and Portman Square for their respectable parents Where London becomes more interesting is Charing Cross . . . the Strand is perhaps the finest street in Europe, blending the architecture of many periods . . . The Inns of Court, and the quarters in the vicinity of the port, Thames Street, Tower Hill, Billingsgate, Wapping, Rotherhithe, are the best parts of London: they are full of character; the buildings bear a nearer relation to what the people are doing than in the more polished

quarters." Disraeli would certainly have resented the demolition of Holywell Street.

Mr. Wheatley's short note on Lincoln's Inn Fields is full of interest. After remarking that we should have had by far the finest square in London if Inigo Jones's plan for the Fields had been carried out, Mr. Wheatley enumerates the houses by that great architect that still remain on the west side. Of Nos. 57-58 and Nos. 59-60, the latter, known as Ancaster House, has two of its noble brick entrance piers still standing. The present condition of the houses on the west side of Lincoln's Inn Fields (Arch Row) is as follows:—No. 50A, altered; 51, 52, plastered and altered; 54, 55, plastered and some of the ornaments cleared away; 57, 58, fine stone buildings; 59, 60, Ancaster House (fine gateway); 50, 53, 56, 61, 62, 63, 64, 65, rebuilt; 66, 67, Newcastle House, built in 1686 by Capt. William Winde (pupil of J. Webb, pupil of Inigo Jones), the house designed by Inigo Jones having been burnt in 1684. As Mr. Wheatley says: "Every man of taste must wish that these houses may be preserved and restored as far as possible to their original condition. We have all too little of Jones's architecture still in London. His work in Covent Garden has been destroyed, and these houses in Lincoln's Inn Fields and the two left in Great Queen Street are treasures which deserve to be treated as historic monuments."

The Society has made a notable addition to the available "Londina Illustrata" by unearthing and reproducing in facsimile the coloured plan of the highway from Hyde Park Corner to Counter's Bridge (Addison Road) which was prepared with so much elaboration and care by Joseph Salway, the surveyor to the Kensington Turnpike Trustees, in 1811. This record reached its present resting-place in the MS. Department of the British Museum after the dispersion of the archives of the old Commissioners of Sewers. The minuteness and completeness of the drawing is in a measure due to the size, 45 in. by 24 in., and the scale 1 in. to 20 ft. There are detailed plans of both sides of the road, and along the top of each sheet elevations are given of every house, every structure, every object on the north side, including trees and foliage.

It may be mentioned in conclusion that the annual subscription to the Society is one guinea and that the hon. secretary is Mr. Bernard Gomme.

"Annual Record of the London Topographical Society," edited by T. Fairman Ordish, F.S.A., and published by the Society at 16, Clifford's Inn, Fleet Street, E.C.

Civil Engineering.

By writing this book Mr. Vernon-Harcourt has done a very great service to the engineering profession. His "Achievements in Engineering," published in 1891, gave descriptions in a popular form of some of the most notable engineering works, and, for the sake of engineering students, only touched incidentally upon the principles involved in their construction. But the scope of this book is entirely different, for it deals primarily with the principles involved in the various branches of engineering construction, and refers to a great variety of works, chiefly with a view of illustrating the methods by which these principles receive their practical application. The work has been ten years in preparation. It will be seen how valuable such an analysis of important executed works and an elucidation of the principles involved must be to the engineer, and it is to be regretted there is not a similar work upon building construction. It is remarkable how comprehensive the book is considering its compass; of course it is somewhat generalized, but this is not a disadvantage, for in this way the sequence of the examples of construction is shown clearly, and there are numerous books to refer to for detailed information on the various classes of works dealt with. Part I. of the book deals with materials, preliminary works, foundations and roads; Part II. with railway, bridge and tunnel engineering; Part III. with river and canal engineering and irrigation works; Part IV. with dock works and maritime engineering; and Part V. with sanitary engineering.

Such a summary of engineering works cannot but be of great advantage to engineers and others, and must aid progress in design. Speciali-

zation, though conducive to progress, is nevertheless unfortunate when it leads into so narrow a groove that those in it know next to nothing of the allied branches of knowledge, and when it causes much waste of labour to any who have to work in other specialized branches than their own branch, or to outsiders, by rendering it necessary for them to travel over the old road instead of going on in the van of progress. This can only be counteracted by general education, and such books as this are the greatest aids.

The book contains much that will be of considerable advantage to other professions and trades than the engineering. To architects the chapters on foundations; arched, suspension, girder, cantilever, and moving bridges; viaducts and tunnels; water supply; sewerage works; and disposal of sewage; will be most useful and interesting. An excellent index, so important in a work of this kind, is provided, and the very numerous illustrations have been well drawn by Mr. Edward Blundell. Altogether the book forms one of the most notable and useful contributions to current technical literature that has been published for some years. The price, too, is very moderate.

"Civil Engineering as applied in Construction" by Leveson Francis Vernon-Harcourt, M.A., M.I.C.E. London: Longmans, Green & Co., 39, Paternoster Row, E.C. Price 14s. nett.

New Patents.

These patents are open to opposition until July 22nd.

1901.—Drawing-Board Apparatus.—11,637. J. TRIMMING, 46, St. Mary's Terrace, Hastings. The apparatus consists of a hinged trestle to which is pivoted a frame carrying a drawing-board. A straight-edge is arranged to slide over the board, and the latter is counterbalanced by a weight. The board or the trestle can be fixed at any desired angle.

Finishing Sanitary Pipes, &c.—14,031. C. E. ROBINSON, Regent Street, and J. STALEY, Albert Village; both of Church Gresley, Leics. The removal of "blisters" on the pipes, before they are burnt, is effected by a device having needles attached to sections of a spring-controlled ring, in combination with a rubber ring. This apparatus is passed into the pipe from end to end. The projecting needles are then drawn in and the rubber smoothes and finishes the pipe.

The following specifications were published on Thursday last, and are open to opposition until July 28th. A summary of the more important of them will be given next week.

1901.—10,552, RICKARD, cross-cut sawing machines. 11,193, ROBERTSON, joining wood boards. 11,445, MACKINTOSH, making stencils. 11,508, ARNOLD, disinfecting apparatus for drains, sewers, &c. 12,281, PEISELER, means for sharpening saws. 12,287, RIDGWAY, apparatus for controlling automatically the distribution of sewage. 12,589, GARCHEY, manufacture of glass stone. 13,152, McDUGALL & LANGFIELD, heating and ventilating buildings. 13,173, SHANKS, baths. 13,764, ROGERS, socket branch-pieces or junctions for use with water-closet trap pipe junctions. 13,813, HAIL, safety appliances for elevators. 13,835, WALLIS, making and pressing concrete. 14,126, HODGKINSON, tiles. 14,290, KIRK, covers for manholes of drains and sewers. 17,051, RÖHMER, pipe cutters. 18,662, WROBEL, road-breaking machines. 20,235, BLIZZARD & TODD, press for bricks. 21,485, HANNEBORG, excavator.

1902.—177, RANSOME, concrete floors and walls. 470, MCAULEY, gravity drain traps. 2,544, SOBBE, manufacturing ridge tiles for roofs from cement and sand. 2,983, MEYER, locks. 3,252, NEWDYKE, doors. 4,155, LITTLE, drawing instruments. 4,404, LEE, sliding doors. 7,356, SMITH, screw for metal, wood, &c. 7,545, COLE & COLE, tap. 8,379, MAASSEN, methods of drying wood.

Mr. E. Hall Ballan, of Doncaster, has been appointed architect for additions to the Oxford Place Day Schools, Doncaster. The extensions contemplated involve an outlay of more than £1,000.

Correspondence.

Building Notes and Memoranda.

To the Editor of THE BUILDERS' JOURNAL.

BIRMINGHAM.

SIR,—Referring to the article on the above subject in your issue for June 4th, I notice an obvious error in calculating the labour constant as applied to excavating (p. 252). The writer states that a man digs '8 cub. yds. of earth in an hour, and, presuming the rate of labour to be 6d. per hour, the cost would work out at 4'8d. per yd. cube. Therefore—a man executes $\frac{8}{10}$ ths yd. cube for 6d. and $\frac{10}{10}$ ths or 1 yd. cube for 4'8d. The correct cost of 1 yd. cube would be 7½d.—Yours truly, G. W.

The error pointed out by "G. W." has arisen from a transposition of terms, which passed unnoticed at the time. In place of saying that a "navvy working for ten hours should dig about 8 cub. yds. of common ground" the paragraph should read that a "navvy working for eight hours should dig about 10 cub. yds. of common ground," whilst instead of taking 10 hours as a basis of comparison, as sometimes adopted, it is much more convenient to take a cub. yd. or other suitable measure as the standard unit in the compilation of a table of constants of labour. From this it follows that an excavator is presumably capable of digging 1 cub. yd. of earth in '8 hours, so that the cost of labour is readily found by multiplying the labour constant by the local rate of wages per hour, as described in the example already given.

T. E. COLEMAN.

PROF. LETHABY ON THE RESTORATIONS OF WESTMINSTER ABBEY.

A GENERAL MEETING of the Society for the Protection of Ancient Buildings was held at Burlington House, Piccadilly, on Wednesday last. Lord Balcarras, who presided, said that during the last twelve months their income was only a trifle over £300, and that was a very small sum for a society which did so considerable an amount of work. With a larger number of members it would be possible for them to deal with a still larger number of buildings. He pleaded, on behalf of the building fund, that persons who gave subscriptions for the rebuilding, repair or restoration of ancient buildings should do so through the Society, as by that means there would be a guarantee of the money being judiciously laid out, while there would be a corresponding improvement to the position and influence of the Society. Miss Morris seconded the motion for the adoption of the report, and this was agreed to.

Professor Lethaby then read a paper on "Westminster Abbey and its Restorations." Referring to the preparations made for the Coronation of Edward I., he said the accounts still in existence showed that a great stable was built in St. Margaret's Churchyard, temporary halls were set up in the gardens of the Palace for the people to feast in, a wooden passage was built from the Palace to the church, and, most interesting entry of all, we were told that the new tower above the choir was covered with boards, and a wooden floor was laid down in the choir, showing both that the works in this part of the church were not yet complete, and, what had been a much controverted point, that a central lantern tower was contemplated in the original scheme. Henry III.'s work was followed by violent destructions, and by the more insidious form of destruction still going on under the name of restoration—false in name as in fact. He traced the story of these destructions from the date in question, and, coming to modern times, said the first third of the nineteenth century seemed to have been devoted to the destruction of the Palace buildings, the Painted Chamber, St. Stephen's Chapel and the Star Chamber. Westminster Hall was renewed with inanity, and Henry VII.'s Chapel was entirely recased. Westminster Gate, towards Tothill Street, and other precious buildings in Dean's Yard, were destroyed. Then came the age of Blore, Scott and Pearson. Blore struck at the lovely early fourteenth-century bays of the cloister and put new in their place, and gave the north front of the nave another dressing. Scott completed the renewal of the cloister,

restored the south transept, and set up the Chapter-house again. Mr. Pearson did not like Wren's work at the north transept and felt called on to re-edit it into its present form. At the moment similar corrections were going forward at the west front, and in the present year the south rose window, renewed less than a century ago, had been cut out and re-done once more. They began with new glass, but, on the principle that it was best to do work thoroughly, stone and all had gone. He would suggest to them how different it would have been with Westminster if, instead of learning, theory and caprice, and this energy in pulling down and setting up, there had been steadily carried on during the last century a system of patching, staying and repairs—a sort of building dentistry. Even yet if they could arrest the process of so-called improvement which was slowly creeping over the old building in a sort of deadly paralysis, and substitute mere daily carefulness, much might be handed on for another age.

Mr. Somers Clarke, in proposing a vote of thanks to Professor Lethaby, said that in connection with the Coronation the most wonderful efforts were now being made to save the fabric of the Abbey. These efforts, he thought, were mainly the outcome of the action which had been taken in the matter by their Society.

Surveying & Sanitation.

A Crematorium is to be erected at the City of London Cemetery at Ilford at an estimated cost of about £7,000, subject to the approval of the plans by the Secretary of State.

A New City Subway.—A subway is to be constructed between the stations of the Central London Railway and the City and South London Railway, in front of the Mansion House.

Public Health.—The Public Health Institute, Edinburgh, built at considerable cost by Sir John Usher, of Norton and Wells, and presented to the University of Edinburgh, was formally handed over to the Senators of the University last week by the donor. Some years ago the late Mr. A. L. Bruce left £5,000 to endow a chair of public health in the University. An additional £2,000 was privately subscribed, and Sir John Usher completed the endowment. Shortly afterwards Sir John intimated his intention of providing the institute in question for giving to the students of the University facilities for the study of public health.

Widening London Streets.—Negotiations are now in progress for the acquisition, with a view to early demolition, of the property between Church Street and Palace Gardens, which has for so long been a source not only of grievous annoyance but of serious danger as regards the heavy general traffic which passes through High Street, Kensington. This much-needed improvement has been undertaken by the London County Council, who have been asked on several occasions to set back the northern side of the street, and whose many suggestions have, from one cause and another, hitherto come to naught. The scheme at last to be undertaken arranges for providing a width of about 60ft., commencing at the south-eastern corner of the public-house at the bottom of Church Street, and continuing, by the setting back of the northern side of the street, to Cumberland Place, a little to the east of Kensington Palace Gardens. In order to develop the surplus land to advantage, the narrow passage known as Brown's Buildings will be widened to about 40ft. The estimated nett cost of the necessary property, after allowing for recoupment, is £66,000, while the cost of paving and other works is estimated at £15,000. The total nett cost of the complete scheme is therefore estimated at £81,000.

A Statue of the late Mr. Rhodes is to be erected at Kimberley in white marble on a base of Rhodesian stone. A monument in which Mr. Rhodes took a deep interest is now being raised to the memory of those who fell in defence of the town, facing which, at a distance of 600yds. and looking north, at an elevated spot on one of the roads made during the siege, it has been decided to erect the statue of the great South African statesman.

New Companies.

Huron Timber Co., Ltd.

Registered to acquire timber estates or timber rights and agricultural lands or other lands or minerals in Tasmania or elsewhere, and to carry on the business of timber and lumber merchants, sawmill proprietors and timber growers, &c. Capital £100,000 in £1 shares. The first directors are W. Forrest, M. Robinson, P. Rottenburg, A. Rodger, R. Paterson and R. Davidson. Registered office: 21, George Square, Glasgow.

Pure Enamel Bath Co., Ltd.

Registered to carry on the business of enamelers, enamel manufacturers, ironfounders, mechanical and sanitary engineers, &c. Capital £7,000 in £1 shares.

Cornisher, Ltd.

Registered to take over the business carried on at Bishop's Hull, Somersetshire, as Cornish Brothers, and to carry on the business of brick, tile and pottery manufacturers, dealers in clay, sand, lime and stone, &c. Capital £3,000 in £1 shares. The first directors are T. S. Penny, E. Cornish and F. W. Penny.

Cannock Chase Colliery Co., Ltd.

Registered to enter into an agreement with the Cannock Chase Colliery Co., Ltd. (in voluntary liquidation), and the liquidators thereof, to acquire the undertaking of the said Cannock Chase Colliery Co., Ltd., and to carry on the business of colliery proprietors, quarry owners, ironfounders, brick makers, general contractors, &c. Capital £150,000 in £100 shares. The directors are R. Griffin, J.P., Lieut. Colonel T. H. Lewin, J.P., G. P. Bidden, F. McClean and F. K. McClean.

James Duncan, Ltd.

Registered to carry on the business of tile layers, marble cutters, masons, &c. Capital £2,000 in £1 shares. Registered office: 106, West Campbell Street, Glasgow.

William Clayton & Co., Ltd.

Registered to carry on the business of carters and contractors, as now carried on by T. H. Aukers Pilkington and Thomas Kent, as William Clayton & Co., at 71, Sackville Street and 70, Temple Street, Manchester, and to deal in and with horses, lorries, carts, stock, &c.; as builders, builders' merchants, stone merchants, quarry owners, brick and tile makers, &c. Capital £2,000 in £1 shares.

R. Wilson, Ltd.

Registered to acquire the undertaking of the Tyne Brickworks, Wallsend, and the Howdon Brickworks, Howdon, and certain interests in land at Oston Junction, and to carry on business as timber merchants, sawmill proprietors, manufacturers of and dealers in articles of all kinds in which timber is used; as brick, tile, pipe and terra-cotta makers, manufacturers of earthenware and china; to develop lands and estates; as house agents, carriers, electricians, shipowners, &c. Capital £12,000 in £1 shares. Governing director, R. Wilson. Registered office: The Grove, Birtley, Durham.

Iacon Stone Co., Ltd.

Registered to carry on the business of artificial stone, cement, brick, tile, china, terra-cotta and ceramic ware manufacturers, clay merchants, &c. Capital £3,000 in £10 shares. Registered office: 61 and 63, Gracechurch Street, E.C.

Art Fittings, Ltd.

Registered to carry on the business of manufacturers of and dealers in all kinds of fittings for electric, gas or oil light, electric heating and cooking apparatus, lamps, telephones, bell-pushes, switches and wall attachments, &c.; as manufacturers of and dealers in art metal work, fenders, fire-irons, door-plates, screens, gates, railings, and all kinds of art metal work for the electric and building trades. Capital £10,000 in £1 shares. Secretary, A. C. Read, 66, Victoria Street, Westminster, which is the registered office.

Lanedrag Granite Quarries, Ltd.

Registered to acquire certain mines and mining rights in Sweden. Capital £2,500 in £1 shares. Registered office: 1, Union Court, Old Broad Street.

Virox, Ltd.

Registered to adopt and carry into effect an agreement with W. D. Fisher, and generally to carry on in all or any of their respective branches the businesses of brick, tile and terra-cotta manufacturers and merchants, quarry owners and stone merchants, fireclay manufacturers, shippers and shipowners, timber and lumber merchants, sawmill proprietors, oil and colour merchants, &c. Capital £500 in £1 shares.

Machen Stone, Lime and Colliery Co., Ltd.

Registered to acquire the business of quarrymen, stone and lime merchants, brick manufacturers and colliery proprietors, as now carried on by T. H. Christophers & H. Watkins in the county of Monmouthshire as the Machen Stone and Lime Co., and, generally, to carry on in all or any of their respective branches the business of mine proprietors, coke and brick manufacturers, builders, &c. Capital £3,000 in £5 shares. Directors: T. H. Christophers (chairman) and H. Watkins.

Berkshire Estates, Ltd.

Registered to acquire any lands, buildings, houses, estates or any other real or personal property, flats, houses, mansions, &c. Capital £2,000 in £1 shares. Registered office: 18, Eldon Street, E.C.

Hanson-Walsh Engineering Co., Ltd.

Registered to acquire as a going concern the business of engineers carried on by J. T. Hanson at Parkwood Mills, Longwood, Yorkshire, and to carry on business as manufacturers of machinery of every description; as engineers and metal founders, wire drawers, tube makers, manufacturers of castings, metallurgists, joiners and carpenters, woodworkers, &c. Capital £5,000 in £10 shares. The directors are B. and A. Broadbent, L. Beaumont, H. Hanson and W. D. Walsh.

COMING EVENTS.

Wednesday, June 18.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion to Gaidhall, Newcastle, at 6 p.m.

ROYAL SOCIETY.—Conversazione at Burlington House.

BUILDERS' FOREMEN'S AND CLERKS OF WORKS' INSTITUTION.—Ordinary Meeting at 8 p.m.

CHEMICAL SOCIETY.—Meeting at 5.30 p.m.

Thursday, June 19.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Annual dinner at Whitehall Rooms, Hotel Metropole.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Annual Dinner

ROYAL SOCIETY.—Meeting at 4.30 p.m.

INSTITUTION OF MINING AND METALLURGY.—(Meeting at the Rooms of the Geological Society, Burlington House, W.). Mr. Herbert O. Hoover on

"The Kaiping Coal Mines and Coal Field, Obihle Province, North China." Mr. H. Livingston Sullivan on

"A Dry Process for the Treatment of Complex Sulphide Ores." Mr. Hans O. Knutsen on "The

"Diehl" Process." Mr. Mervyn S. Stutchbury on

"The Pierette Concentration Mill." 5 p.m.

Monday, June 23.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Presentation of the Royal Gold Medal at 8 p.m.

Tuesday, June 24.

SOCIETY OF ARTS.—Conversazione at the Royal Botanical Gardens, Inner Circle, Regent's Park, 8.30 p.m. to 12 p.m.

Wednesday, June 25.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, June 26.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Visit to Salisbury Cathedral.

Friday, June 27.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

Saturday, June 28.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Excursion to Carlisle and Lanercost. Visits to Carlisle Cathedral, Castle and Town Hall, and Naworth Castle, and Lanercost Priory.

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DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
June 19	London, N.W.—Public Conveniences	Hampstead Borough Council	O. E. Winter, Borough Engineer, Town Hall, Haverstock Hill, N.W.
" 19	London, W.—Branch Library	Ealing Town Council	O. Jones, Borough Engineer, Town Hall, Ealing, W.
" 19	London, W.—Engine and Accumulator Rooms, &c. ..	Fulham Guardians	F. H. Medhurst, 13 Victoria Street, S.W.
" 19	Bradford—Extension of Engine House	Corporation	Mawson & Hudson, 2 Exchange, Bradford.
" 19	Kendal—Additions, &c., to Schools	—	J. Stalker, 57 Highgate, Kendal.
" 19	Netherfield, near Nottingham—Church	—	W. J. Morley & Son, 269 Swan Arcade, Bradford.
" 19	Tuckingmill, Cornwall—Seating, &c., at Chapel ..	Wesleyan Chapel Trustees	S. Hill, Architect, Green Lane, Redruth.
" 19	Rainhill—Three Cottages	Lancashire Asylums Board	J. Gornall, Clerk, Rainhill Asylum.
" 19	Keswick—Banking Premises	Carlisle and Cumberland Banking Co. ..	J. H. Martindale, Architect, Viaduct Chambers, Carlisle.
" 19	Bradford—Nine Houses	—	Brayshaw & Dixon, Architects, Bowling Old Lane, Bradford.
" 20	Widnes—Chapel	—	O. W. D. Joynson, Architect, Wednesbury.
" 20	Brighton—Portland Cement	Town Council	F. J. C. May, Borough Engineer, Town Hall, Brighton.
" 20	Broomhill—Store Premises and House	Co-operative Society	T. Tulip, Whinney Hill, Choppington.
" 20	St. Just, Cornwall—Renovation and Reseating Chapel	—	J. Madder, Pendennis, St. Just.
" 21	Kilbeggan—Convent Chapel	—	W. H. Byrne, 20 Suffolk Street, Dublin.
" 21	Dundee—Masonry, &c., for Bridge	Town Council	W. Mackison, 91 Commercial Street, Dundee.
" 21	Halifax—Five Houses	—	C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.
" 21	Grimethorpe Colliery, near Cudworth—Church ..	—	Borcham & Morton, 24 John Street, Sunderland.
" 21	Hatton, near Warwick—Private Lunatic Asylum ..	—	E. Mansell, 47 Temple Row, Birmingham.
" 21	Alloa, Scotland—Extension of Premises	Co-operative Society, Ltd.	J. Mitchell, Architect, Alloa.
" 21	Bacup, Lancs.—Repairs to Baths	Baths Committee	Borough Surveyor, Bacup, Lancs.
" 21	Leeds—Public Baths	Corporation	J. L. Fox, 13 Park Square, Leeds.
" 21	Portreath, Cornwall—Rebuilding Battery House ..	—	S. Hill, Architect, Green Lane, Redruth.
" 21	Pontardulais, Wales—Church	—	W. Griffiths, Architect, Falcon Chambers, Llanelli.
" 21	Amulree, Scotland—Stone Wall and Fencing ..	—	Condie, Mackenzie & Co., W.S., Perth.
" 21	Glasgow—Tenements	Corporation	F. Burnet, 180 Hope Street, Glasgow.
" 21	Stainton, near Barnard Castle—Additions to School ..	—	Clerk of Works' Office, The Woodyard, Streatham, Dirlington.
" 21	Aberangell—Chapel and Schoolroom	—	R. H. Townsley, General Manager, Municipal Offices, Leeds.
" 23	Leeds—Portland Cement	Gas Committee	W. D. Statham, Surveyor, Ellington, near Canterbury.
" 23	Leeds—Warehouses, Alterations, &c., to Hotel & Inn ..	—	T. Winn & Sons, 92 Albion Street, Leeds.
" 23	Herne, Kent—Repairs to Hospital, &c. ..	Blean Rural District Council	G. T. Bassett, Architect, Aberystwyth.
" 23	Pennydarren, Merthyr Tydfil—Fifty-eight Houses ..	Brynglas Building Club	T. Roderick, Architect, Glebe Road Street, Merthyr Tydfil.
" 23	Sowerby Bridge, Yorks—Brickwork and Ironwork ..	Gas Committee	A. W. Bissell, Engineer, Gasworks, Sowerby Bridge.
" 23	Workington—Dwelling-House	S. Wilkinson	W. G. Scott & Co., Architects, Victoria Buildings, Workington.
" 23	Ynisher, Wales—Extension of Premises	Co-operative Society	J. Rees, Architect, Pentre.
" 23	Shepherd's Bush, W.—Workhouse and Infirmary ..	Hammersmith Board of Guardians ..	Giles, Gough & Trollope, Architects, 23 Oraven Street, Charing Cross, W.C.
" 23	London, S.W.—Technical Institute	London County Council	Architect's Department, 18 Pall Mall East, S.W.
" 23	Ilford—School	School Board	O. J. Dawson, Architect, Bank Buildings, Ilford, Essex.
" 23	West Bromwich—Schools	School Board	A. Long, 21 New Street, West Bromwich.
" 23	Horsforth—Church Aisle, &c.	—	J. B. Fraser, 8 Park Square, Leeds.
" 23	Edinburgh—Alterations, &c., to Schools	School Board	Mr. Carfrae, 3 Queen Street, Edinburgh.
" 23	Ulverston—Alterations, &c., to Council Offices ..	Urban District Council	J. W. Grundy & Son, Architects, Ulverston.
" 23	London, S.E.—Branch Library	Lewisham Borough Council	Borough Surveyor, Town Hall, Oatford, S.E.
" 24	Blackwood, Mon.—Houses and Roads	Osborne Building Club	James & Morgan, Architects, Charles Street, Cardiff.
" 24	Salford—Joiners Work, Fittings, & Timekeeper's Offices	Tramways Committee	Central Car Depot, Walmsley Road, Broughton.
" 24	Walthamstow—Watch Room at Fire Station	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
" 24	Badshot Lea, near Aldershot—Church	—	O. H. M. Milleham, Architect, Badshot House, Badshot, Lea.
" 24	Salford—Stables, Engine House, &c.	Lighting and Cleansing Committee ..	W. R. Sharp & Foster, 28 Deansgate, Manchester.
" 24	Acton, W.—Public Baths	District Council	D. J. Ebbetts, 242 High Street, Acton, W.
" 25	Tresawle, Cornwall—Stable and Wain house	—	H. S. Mitchell, Farmhouse, Tresawle, Probus.
" 25	Manchester—Portland Cement, Lime, &c. ..	Gas Committee	O. Nickson, Superintendent, Gas Department, Town Hall, Manchester.
" 25	London, S.E.—Town Hall Extension	Southwark Borough Council	A. Harrison, 81 Borough Road, S.E.
" 25	Rotherham—Tramcar Sheds, &c.	Corporation	J. Platts, Architect, Rotherham.
" 26	Plymouth—Boiler Seatings, Engine Bed, &c. ..	—	J. Paton, Borough Engineer, Plymouth.
" 27	Thornton, Yorks—Twenty-nine Houses &c. ..	—	M. Hall, 29 Northgate, Halifax.
" 28	Walsall—Alterations, &c., to Tramway Depot ..	Corporation	R. H. Middleton, Borough Surveyor, Walsall.
" 28	Wick—Offices and Boundary Walls at School ..	School Board	D. W. Georgeson, Clerk, Board's Offices, Wick.
" 28	Seacombe, Cheshire—Waiting Rooms, &c., at Ferry ..	Wallsall Urban District Council	W. H. Travers, Engineer, Public Offices, Egremont, Cheshire.
" 30	Bedwas, Mon.—Additions, &c., to School	School Board	J. H. Phillips, Architect, Olive Chambers, Windsor Place, Cardiff.
" 30	Cairo—Bookcase, Cupboards, &c., at Museum ..	Public Works Department	Chief of Administrative Service, Cairo.
" 30	Hornchurch—Extension, &c., of Church	—	F. W. Thompson, Berthor Road, Hornchurch.
" 30	Dublin—Six Cottages	Great Northern Railway Co.	Company's Engineer in-Chief, Amiens Street, Dublin.
" 30	Newcastle-upon-Tyne—Conveniences	Sanitary Committee	C. S. Errington, Archt., Victoria Bldgs., Grainger St. W., Newcastle.
" 30	Hastings—Portland Cement	Corporation	O. H. Palmer, Borough Engineer, Town Hall, Hastings.
July 3	Purton, Wilts—Alterations to Workhouse	Union Guardians	R. J. Beswick, 35 Regent Street, Swindon.
" 3	Woolwich—Twenty-five Houses	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 4	Giffach Goch, Wales—Extension of Schools	Llantrisant School Board	J. Rees, Architect, Pentre, Rhondda.
" 4	Bradwell, near Southminster—Coast Guard Buildings	Admiralty	Director of Works Department, Admiralty, Northumberland Avenue, W.C.
" 4	Bexley Heath, Kent—Electric Generating Station ..	Urban District Council	Morley & Dawbarn, 82 Victoria Street, Westminster.
" 5	Glasgow—College Buildings	Technical College Governors	H. F. Stockdale, 38 Bath Street, Glasgow.
" 9	Oleshunt—Twelve Workmen's Cottages	Urban District Council	A. C. Lee, Clerk, Manor House, Oleshunt.
" 16	Carshalton, Surrey—Convalescent Hospital	Metropolitan Asylums Board	Treadwell & Martin, 2 Waterloo Place, Pall Mall, S.W.
" 19	Coombe Hill, near Aylesbury—Stone War Monument	—	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
No date	Army Contracts—Jobbing Work Building Works (works up to £5,000, and works over this sum).	Secretary of State for War	A. Major, Director of Army Contracts, War Office, Pall Mall, S.W.
ENGINEERING:			
June 19	New Brighton, Cheshire—Reservoir, &c.	Wallsall Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 19	Alexandria, Egypt—Swing Bridge over Canal ..	—	Inspector of Irrigation, 3rd Circle, Alexandria.
" 19	Tuckingmill, Cornwall—Heating Apparatus	Wesleyan Chapel Trustees	S. Hill, Architect, Green Lane, Redruth.
" 20	Genoa—Electric Lanterns and Lamps	Italian Government	Commercial Intelligence Branch of Board of Trade, 50 Parliament Street, London, S.W.
" 20	Bootle, Lancs.—Electric Lighting School	School Board	F. K. Wilson, Clerk, School Board Offices, Bootle.
" 20	Stowmarket, Suffolk—Cleaning-out Canal	Stowmarket Navigation	H. Miller, 16 Museum Street, Ipswich.
" 20	Little Woolton, Liverpool—Electric Lighting ..	Urban District Council	R. Simmons, Surveyor, Grange Lane, Gateacre, near Liverpool.
" 20	Chelmsford—Pump	Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
" 21	Dundee—Steel Girder Bridge	Town Council	W. Mackison, 91 Commercial Street, Dundee.
" 21	Lisnakea, Ireland—Wood Supply	Rural District Council	J. O'R. Hoey, Clerk, Council Offices, Lisnakea.
" 21	Kirkcaldy—Electric Wiring Central Station	Corporation	Kennedy & Jenkin, 17 Victoria Street, Westminster.
" 21	Didcot—Steel Tank	Wallingford Rural District Council ..	G. F. Slade, Clerk, Market Place, Wallingford.
" 23	East Ham—Two Boilers	Urban District Council	A. H. Campbell, Surveyor, Public Offices, East Ham.
" 23	Falkirk—Waterworks	Water Trustees	W. R. Copland, 146 West Regent Street, Glasgow.
" 24	London—Galvanised Corrugated Iron Building ..	County Council	Architect's Department (General Section), 19 Charing Cross R.I.
" 24	Alford, Lincs—Lighting Town	Urban District Council	J. E. H. Sergeant, Clerk, Alford.
" 24	Lichfield—Alterations to Sewage Tank, &c. ..	Rural District Council	W. E. Rogers, Surveyor, Rugeley.
" 24	Glasgow—Pumping Engines	Corporation	W. Foulis, 45 John Street, Glasgow.
" 24	Bury, Lancs—Tramways	Tramways Committee	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.
" 24	Southall, Middlesex—Alterations, &c., to Sewage Disposal Works.	Urban District Council	R. Brown, Engineer, Public Offices, Southall.
" 26	Dublin—Buoys	Commissioners of Irish Lights	Engineer, Irish Lights Office, Carlisle Buildings, Dublin.
" 27	Walsall—Booster and Switches	Corporation	A. Wyllie, Borough Electrical Engineer, Wolverhampton Street, Walsall.
" 28	Bollington, near Macclesfield—Waterworks	Urban District Council	W. H. Rudford, Albion Chambers, King Street, Nottingham.
" 28	Walsall—Widening Bridges, &c.	Corporation	Borough Surveyor, Bridge Street, Walsall.
" 30	Gildersome, Yorks—Sewage-Disposal Works	Urban District Council	J. Wagh, Engineer, Sunbridge Chambers, Bradford.
" 30	Sydney, N.S.W.—Bridge across Harbour	—	Under-Secretary for Public Works, Sydney.
" 30	Pwllheli, Carnarvonshire—Harbour Works	Corporation	W. T. Douglas, 15 Victoria Street, Westminster, S.W.
July 3	Manchester—Dock Works, &c.	Dock & Warehouse Extension Co., Ltd. ..	W. H. Hunter, 41 Spring Gardens, Manchester.
" 4	Bexley Heath, Kent—Steelwork for Electric Generating Station.	Urban District Council	Morley & Dawbarn, 82 Victoria Street, Westminster.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
July 5	Ipswich—Electric Lighting Plant	Corporation	W. Bantoft, Town Clerk, Town Hall, Ipswich.
" 8	West Ham—Electric Tramcars	Corporation	J. K. Bock, Borough Electrical Engineer, Abbey Mills, West Ham.
" 12	Lowestoft—Tramways	Corporation	W. C. O. Hawtayne, 9 Queen Street Place, London, E.C.
" 31	London, S.W.—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.
" 31	Army Contracts—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.
Sept. 1	Valparaiso, Chile—Electric Tramways	War Office	Chilian Consulate, 10 Lime Street, E.C.
" 15	Launceston, Tasmania—Electric Power Transmission Extensions.	Mayor and Aldermen	J. Terry & Co., 7 Great Winchester Street, E.C.
IRON AND STEEL:			
June 19	Pentre, Glamorgan—Cast-iron Pipes	Rhondda Urban District Council	O. Thomas, Gas and Water Offices, Pentre, R.S.O., Glamorgan.
" 19	Cork—Iron Name Plates	County Borough Council	City Engineer, Municipal Buildings, Cork.
" 23	Leeds—Stores and Materials	Gas Committee	R. H. Townsley, General Manager, Municipal Offices, Leeds.
" 24	Bury, Lancs—Rails, &c.	Tramways Committee	A. W. Bralley, Borough Engineer, Corporation Offices, Bury.
" 25	Manchester—Iron Castings, &c.	Gas Committee	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
July 2	Amsterdam—Railway Materials, &c.	Government	M. Nighoff, Bookseller, The Hague.
" 4	Bexley Heath, Kent—Steelwork for Elec. Gen. Station	Urban District Council	Mordey & Dawbarn, 82 Victoria Street, Westminster.
PAINTING AND PLUMBING:			
June 19	Tuckingmill, Cornwall—Painting and Decorating ..	Wesleyan Chapel Trustees	S. Hill, Architect, Green Lane, Redruth.
" 19	London, W.—Painting, Whitewashing, &c., at Infirmary	Fulham Guardians	E. J. Mott, Clerk, Offices, Fulham Palace Road, Hammersmith, W.
" 19	Cardiff—Painting at Sanatorium	Corporation	W. Harper, Borough Engineer, Town Hall, Cardiff.
" 19	York—Painting Inside of School	School Board	Clerk, School Board Offices, York.
" 21	Bacup, Lancs—Painting, &c., House	Recreation Ground Committee	Borough Surveyor, Bacup, Lancs.
" 21	Dukinfield—Painting, &c., Cemetery Chapels, &c. ..	School Board	Registrar, Dukinfield.
" 21	Belper—Painting, &c., at Schools	School Board	Walker & Terry, Clerks, School Board Office, Belper.
" 21	Leeds—Painting Ten Houses	Corporation	City Engineer, Municipal Buildings, Leeds.
" 23	Leeds—Colours, Lead, Brushes, Varnish, &c.	Gas Committee	R. H. Townsley, General Manager, Municipal Offices, Leeds.
" 23	Herne, Kent—Cleansing, Repainting, &c.	Blean Rural District Council	W. D. Statham, Surveyor, Eddington, near Canterbury.
" 23	Edinburgh—Painting at Schools	School Board	Mr. Cairns, 3 Queen Street, Edinburgh.
" 25	Manchester—Brushes, Paints, &c.	Gas Committee	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
" 28	Whitwood Mere, Castleford—Whitewashing Schools..	School Board	J. Redpath, 72 Methley Road, Whitwood Mere.
" 30	East Ham—Cleansing, Whitewashing, &c.	School Board	H. C. Padgett, Clerk, School Board Office, East Ham, E.
" 10	Sheffield—Painting, Decoration, &c., at School of Art	Technical Instruction Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
July 1	Yardley, Birmingham—Cleansing, Painting, &c., Schools	School Board	A. Harrison, 109 Oolmore Road, Birmingham.
" 1	Rotherham—Painting, &c., Schools	School Board	W. H. Corbridge, Clerk, Board's Offices, Rotherham.
" 2	Sheffield—Painting, &c., Schools	School Board	J. F. Moss, Clerk, Board's Offices, Sheffield.
" 4	Hull—Cleansing and Distemping at Workhouse ..	Sculcoates Union Guardians	T. B. Atkinson, 11 Trinity House Lane, Hull.
No date.	Army Contracts—Painting and Repairs	Secretary of State for War	A. Major, Director of Army Contracts, War Office, Pall Mall, S.W.
ROADS AND CARTAGE:			
June 19	London, W.—Making-up Roads	Ealing Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.
" 19	London, N.W.—Wood and Sanitary Block-paving ..	Hamstead Borough Council	O. E. Winter, Borough Engineer, Town Hall, Haverstock Hill, N.W.
" 19	Hailsham, Sussex—Hire of Road Rollers	Rural District Council	J. Huxley, 17 London Road, Hailsham.
" 19	Pentre, Glamorgan—Materials	Rhondda Urban District Council	W. J. Jones, Surveyor, Council Offices, Pentre, R.S.O.
" 20	Brighton—Granite Spalls	Town Council	F. J. O. May, Borough Surveyor, Town Hall, Brighton.
" 21	Lewes—Scarifying and Steam Road-Rolling	Town Council	Borough Surveyor, Town Hall, Lewes.
" 21	Romsey, Hants—Hire of Steam-Roller	Rural District Council	J. J. White, District Surveyor, Romsey.
" 21	Brighouse—Street Paving	Corporation	Borough Engineer, Municipal Buildings, Brighouse.
" 21	Levenshulme, Lancs—Private Street Works	Urban District Council	J. Jepsen, Guardian Chambers, Teviot Dale, Stockport.
" 23	Burgess Hill, Sussex—Flints	Urban District Council	A. F. Hardwick, Clerk, Burgess Hill.
" 23	Farnworth, Lancs—Road, Tramway Reconstruction..	Urban District Council	W. J. Lomax, 11 Fold Street, Bolton.
" 23	Harwich—Tar-Paving	School Board	G. D. Hugh-Jones, Clerk, Harwich.
" 23	Kettering—Street Works	Urban District Council	Surveyor, Market Place, Kettering.
" 23	London, N.—Street Works	Edmonton Urban District Council	G. E. Machus, Town Hall, Lower Edmonton.
" 13	Pennydarren, Merthyr Tydfil—Forming Roads, &c. ..	Brynglas Building Club	T. Roderick, Architect, Gledland Street, Merthyr Tydfil.
" 23	Prestwich, Lancs—Street Improvements	Urban District Council	Surveyor, Chester Bank, Prestwich.
" 24	West Ham, E.—Making-up Streets	Borough Council	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
" 24	North Shields—Paving, &c.	Fynemouth Corporation	J. F. Smilie, Borough Surveyor, North Shields.
" 24	Walthamstow—Street Works	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
" 25	Braintree, Essex—Granite	Urban District Council	H. H. Nankivell, Surveyor, Vestry Hall, Braintree.
" 25	Lewes—Materials	Borough Surveyor, Town Hall, Lewes.	Borough Surveyor, Bridge Street, Walsall.
" 23	Walsall—Widening Roads	Corporation	W. T. Streather, Surveyor, Council Offices, Waltham Abbey.
July 1	Waltham Abbey—Furnace Slag	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
" 1	Tottenham—Making-up Roads	Urban District Council	E. J. Simpson, Surveyor, North Waltham.
" 2	London, W.—Granite	Urban District Council	
SANITARY:			
June 19	Chester-le-Street—Sewage-disposal Works	Rural District Council	D. Balfour & Son, 3 St. Nicholas Buildings, Newcastle-on-Tyne.
" 20	Tonnes, Devon—Sewers, &c.	Union Guardians	W. F. Tollit, Surveyor, Tonnes.
" 10	Banff, Scotland—Drainage Works	District Committee	J. Graut, 23 Castle Street, Banff.
" 21	Pontefract—Sewage Works	Town Council	B. Latham, Parliament Mansions, Victoria Street, Westminster.
" 21	Chelmsford—Pipes, Sewers, &c.	Town Council	Borough Surveyor, 16 London Road, Chelmsford.
" 23	Herne, Kent—Sewers, Drains, &c.	Blean Rural District Council	W. D. Statham, Surveyor, Eddington, near Canterbury.
" 23	Edinburgh—Sewer	Magistrates and Council	Borough Engineer, City Chambers, Edinburgh.
" 24	Asbury-de-la-Zouch—Sewers, &c.	Urban District Council	J. B. Everard, 6 Millstone Lane, Leicester.
" 25	Manchester—Lime, &c.	Gas Committee	O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
" 25	Bexley Heath, Kent—Sewerage Works	Urban District Council	W. J. Lomax, 11 Fold Street, Bolton.
" 30	Gildersome, Yorks—Sewage-disposal Works	Urban District Council	J. Waugh, Engineer, Sandridge Chambers, Bradford.
July 7	South Stoneham—Sewerage Works	Rural District Council	Bailey-Denton, Son, Lawford & Symons, Palace Gardens, Westminster.
" 10	London, S.E.—Reconstructing Drainage, &c.	Southwark Union Guardians	G. D. Stevenson, 13 & 14 King Street, Cheapside, E.C.
No date.	London, W.—Pipe Sewer	Paddington Borough Council	E. B. Newton, Borough Surveyor, Town Hall, Paddington, W.
TIMBER:			
June 19	Walthamstow—Open Pale Fencing, Gates, &c.	Fulham Guardians	Engineer, East London Waterworks Co., Clapton, N.E.
" 19	London, S.W.—Timber for Firewood	Great Northern Railway Co. (Ireland)	E. J. Mott, Clerk, Fulham Palace Road, Hammersmith, W.
" 23	Dundalk—Sleeper Blocks	Town Council	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
" 24	Dover—Oak Pale Fencing	Gas Committee	H. E. Stigoe, Maison Dieu House, Biggin Street, Dover.
" 25	Manchester—Timber		O. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June 27	West Hartlepool—School	£75, £35.	J. R. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Anson House, South John Street, Liverpool.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings ..	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices ..	£100, £75, £50.	V. Orchard, Town Clerk, 20 Fanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg gorodskaya Uprava, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	C. H. J. Talmage, Southchurch Road, Warnor Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c. ..	£200, £100, £50.	W. H. Prescott, Engineer, U.D.O. Offices, Tottenham.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.
No date.	Kirkley—Wesleyan Church	—	Rev. E. H. Higson, Lowestoft.

Trade and Craft.

Burglar-Proof Window-Fasteners.

Mr. J. H. Edwards, of 33, Essex Road, Manor Park, London, E., is the patentee of a self-locking device called the "New Century" window-fastener. On the outer sash is screwed a small metal frame having a little weight that slides up and down in a slot, working in connection with a bolt pivoted in the same frame. On the inner sash is screwed a segmental piece of metal having a short lug on its front edge. The working of the fastener is as follows:—When it is desired to raise the inner sash, the sliding weight is lifted clear of the bolt, which is pushed up by the sash and remains in that position. When, however, the sash is closed, the bolt is automatically jerked and falls down on to the lug, the weight at the same time descending behind the bolt and so preventing the opening of the window from the outside.

Roofing Sheets, &c.

A catalogue of roofing sheets, ridging, guttering, tanks, &c., has been sent to us by Messrs. Frederick Braby & Co., Ltd., of Petershill Road, Glasgow, who also have works at London, Deptford, Liverpool, Bristol and Falkirk. The "Empress Brand" of galvanised iron and steel roofing sheets are given an extra coating of pure spelter, and though this adds to the cost per ton a lighter gauge may be used, and it is thus claimed that the price per sheet is not increased. All kinds and patterns are obtainable—straight corrugated, curved, double-curved, sheets turned or bent up at one end, sheets with scalloped or serrated tops, or flat steel sheets. Various kinds of ridging are also made, some specially designed to fit the flutes of the corrugated sheets. Messrs. Braby also manufacture the patent "Eclipse" corrugated skylights, as well as wrought-iron mitre-joint sashes and casements. Numerous kinds of ventilators, manhole covers, hot-water cylinders, hot-water tanks and cisterns, boilers, railing and iron buildings are also supplied, and in this connection reference should be made to the "Bower-Barff" rustless process adopted by the firm in the treatment of iron and steel. By this process a magnetic oxide is formed on the surface, which prevents oxidation. Articles so treated have a slaty colour and do not require to be painted, but if this is desired it may be done with the certainty that the paint or gilt will not peel off, as on ordinary iron. Hitherto the high cost of rustless iron has prevented its use becoming extensive, but with the new plant laid down at their Falkirk works Messrs. Braby will be enabled to greatly cheapen the cost of production.

A New Hospital at East Ham has been erected by the fund started to celebrate the Diamond Jubilee of Queen Victoria, and supplemented by a gift of £5,000 from Mr. Passmore Edwards, whose name the hospital bears. The cost is £9,000.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ASHTON-UNDER-LYNE.—For the erection and completion of hospital buildings, except plumbing, glazing, painting, and drainage works, for the Guardians. Messrs. John Eaton, Son, & Cantrell, architects:—

	Time to complete (months).
T. & W. Meadows, Stockport ...	£30,485 21
L. Pike & Co., Hooley Hill ...	29,710 30
T. Dean, Ashton-under-Lyne ...	29,550 21
W. A. Peters & Sons, Rochdale ...	29,225 24
E. Marshall, Ashton-under-Lyne ...	29,107 24
J. Riddard, Ashton-under-Lyne ...	28,880 24
H. J. Whitehead, Oldham ...	28,750 —
Garside, Barnes & Co., Stalybridge ...	28,700 21
S. & J. Sneathurst, Oldham ...	28,500 —
W. Storrs, Sons & Co., Stalybridge ...	28,199 15
J. Gibson & Son, Dukinfield ...	28,100 24

* Accepted.

BARRY.—For the erection of new chapel for Bethel Church. Messrs. George Morgan & Son, architects, Carmarthen:—

	Amended to
S. Hopkins ...	£3,595
D. G. Price ...	£3,078 8 8
J. Prout ...	£3,333
	£2,923 9 6

[All of Barry.]

BEVERLEY.—For the erection of a new pavilion for 120 patients, and also for certain alterations of and additions to the administrative department of the East Riding Lunatic Asylum, Beverley, for the Erection Committee. Mr. C. H. Hebblethwaite, A.R.I.B.A., P.A.S.I., architect, 10 Waterhouse Street, Halifax:—

Murgatroyd & Son, Idle ...	£24,780 0 6
Nicholson & Son, Leeds ...	24,488 0 0
G. Pape, Beverley ...	24,475 0 0
Potts & Fuley, Beverley ...	24,075 0 0
A. Lyon, Malton ...	23,907 0 0
T. F. Ullathorne, Selby ...	23,880 3 5
J. Constable, Beverley ...	22,845 0 0

BRENTWOOD (ESSEX).—For the erection of 20 workmen's dwellings, for the Brentwood (Essex) Urban District Council. Mr. James E. Fothergill, P.A.S.I., surveyor:—

J. Smith & Sons, Witham ...	£7,305 0 0
S. Parmenter, Braintree ...	7,103 0 0
Wilmott, Iford ...	6,947 0 0
H. Potter, Chelmsford ...	6,940 0 0
E. West, Chelmsford ...	6,797 0 0
J. Pavitt & Sons, Aveley ...	6,793 2 6
Legg & Clarke, Clacton-on-Sea ...	6,525 0 0
Oak Building Company, Cambridge ...	6,239 0 0
Myall & Upson, Clacton-on-Sea ...	5,883 0 0
Harris & Row, Ltd., Shoeburyness ...	4,900 0 0

* Accepted provisionally.

BRIGHTON.—For the supply and fixing of certain furniture and fittings required for the public library and art galleries, for the Town Council. Mr. Francis J. C. May, M.I.C.E., borough engineer:—

Chippierfield & Butler, Brighton ...	£1,040 13 5
Field & Co., Brighton ...	1,382 10 6
General Builders Company, London ...	1,331 4 6
Schoolbred & Co., London ...	1,255 2 0
Library Supply Company, London ...	1,183 10 6
Hampton & Sons, Pall-mall East, London ...	1,154 10 6
S.W. ...	1,154 10 6
North of England Furnishing Company, Darlington ...	1,125 5 8

* Accepted.

BRYNAMMAN (GLAMORGANSHIRE).—Accepted for the erection of four new cottages. Messrs. George Morgan & Son, architects, Carmarthen:—

J. D. Howells, Station Road, Brynamman ...	£715
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CARMARTHEN.—For the erection of new premises for the London and Provincial Bank, Ltd. Messrs. George Morgan & Son, architects, Carmarthen:—

T. Hughes, Llanelly ...	£3,050
C. Young, Pembroke Dock ...	3,047
Brown, Thomas, & John, Llanelly ...	3,375
B. Howell & Son, Ltd., Llanelly ...	3,238

* Accepted.

CHARMINSTER (DORSET).—For the erection of a house for 100 private patients at Herrison, near Dorchester, for the County Council. Mr. George T. Hine, architect, 35 Parliament Street, S.W.:—

Wills & Sons ...	£49,880
Pethick Bros. ...	46,094
Wakeham Bros. ...	46,314
Pattison & Sons ...	46,540
E. C. Bull ...	46,308
King & Sons ...	44,432
Jenkins & Sons, Ltd. ...	43,600
W. J. Bloxham ...	43,407

* Accepted provisionally.

CARMARTHEN.—Accepted for the erection of Caretaker's house for Priory Church. Messrs. George Morgan & Son, architects, Carmarthen:—

W. P. Davies & Co., Carmarthen ...	£276
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CARMARTHEN.—For additions to St. Ann's cottage. Messrs. George Morgan & Son, architects, Carmarthen:—

D. Jones, Carmarthen ...	£257 18
W. P. Davies & Co., Carmarthen ...	180 10

* Accepted.

CLYDEBURN (PEM).—Accepted for additions to "Trefach," for Mr. E. M. Dawson Thomas. Messrs. George Morgan & Son, architects, Carmarthen:—

Young Bros., Mynachlogddu ...	£204
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DAIRMOUTH.—For the construction of stone, brick, and concrete sidewalks, together with granite and lias stone kerb and channel, for the Urban District Council. Mr. Arthur Smith, C.E., borough surveyor:—

R. T. Pillar, Dairmouth ...	£1,783 10 2
R. C. Pillar, Dairmouth ...	1,029 15 10
M. Bridgman, Paignton ...	1,435 18 9
S. F. Clothier, Street, Somerset ...	1,341 5 0

* Accepted.

DIDSBURY (MANCHESTER).—For the erection of a house, architects, for Dr. Geo. E. Crowe. Messrs. C. K. & T. C. Mayor, architects, 41 John Dalton Street, Manchester:—

Padmore & Sons, Didsbury & Oak ...	£1,430
McFarlane & Son ...	1,535
Megarity & Co. ...	1,545
E. Jackson ...	1,500

* Accepted.

FENTON (STAFFS).—For the erection of new infants' school, Queen Street, Fenton, for the Stoke-on-Trent (U.D.) School Board. Messrs. R. Scrivener & Son, architects, Hanley:—

P. H. Embrey, Longton ...	£3,843
S. Wilson, Jun., Newcastle ...	3,509
Tompkinson & Battelley, Longton ...	3,470
C. Cornes & Sons, Hanley ...	3,400
T. Godwin, Hanley ...	3,395
J. Bagnall, Fenton ...	3,350
T. R. Yoxall, Stoke-on-Trent ...	3,240
Micklejohn & Sons, Stoke-on-Trent ...	3,249
Brain & Smith, Longton ...	3,127
P. H. Bennion, Longton ...	3,031

* Accepted.

GELLIGAER (WALES).—For the several works to be done in the construction of about 3,200 yards of 9-in. and 2,100 yards of 6-in. stoneware and cast-iron pipe sewers, manholes, ventilators, pillars, retaining walls, flushing tank, bacterial beds, and straining tank, &c., at Gelligaer and Troeddyrhiw, in the parish of Gelligaer, for the Gelligaer and Rhigos Rural District Council. Mr. James P. Jones, surveyor, Hengoed, via Cardiff:—

J. E. Evans, Inverness Road, Cardiff ...	£7,001 19 4
F. Davies & Co., Bargoed, via Cardiff ...	6,749 13 0
W. Lewis, Birtford, via Cardiff ...	6,234 18 6
A. G. Collins & Co., Golden Grove, Barry ...	5,900 10 10
W. Williams & Co., New Tredegar, via Cardiff ...	5,876 7 4
Jones & Davies, 20 Regent Street, Dowlais ...	5,817 14 3
E. Jenkins, Dowlais ...	5,527 10 10

LEYTON (ESSEX).—For paving, channelling, &c., a portion of Grove Green Road, for the Leyton Urban District Council. Mr. William Dawson, M.I.C.E., surveyor:—

W. Griffiths & Co., Hamilton House, Bishops Cleeve Street, E.C. ...	£1,074 3 8
G. J. Anderson, 20 North Street, Poplar, E. ...	1,033 13 11
W. Manders, 8 Abbots Park Road, Leyton ...	1,000 0 0

* Accepted.

LONDON, S.E.—For kerbing, channelling, foundations for asphalt paving, and road work in Stradella Road (in completion), Horne Hill, for the Camberwell Borough Council:—

J. E. Etheridge, Rollins Street, Old Kent Road ...	£1,456 10 10
W. H. Wheeler, Blackfriars ...	1,250 9 0
Fry Bros., Greenwich ...	1,306 18 0
W. Pearce, Forest Hill ...	1,265 1 4
T. Adams, Wood Green ...	1,255 17 0
A. C. Soan, Streatham ...	1,108 11 8
Lawrence & Thacker, Tooting ...	1,068 19 0
W. Griffiths & Co., City ...	1,005 7 10
G. J. Anderson, Poplar ...	1,046 19 4
J. Mowlem & Co., Westminster ...	1,023 4 2

* Recommended for acceptance.

LONDON, S.W.—For the supply, delivery, and erection on their premises of the following plant: (Contract No. VII.) pipework, for the Fulham Board of Guardians:—

Rosser & Russell, Ltd. ...	£1,043 4
Sir Hiram Maxim, Electrical & Engineering Co., Ltd. ...	1,589 4
D. Stewart & Co., Ltd. ...	1,541 10
Sir Hiram Maxim, Electrical & Engineering Co., Ltd. ...	1,430 4
Babco, & Wilcox ...	1,413 3
Aiton & Co. ...	1,350 13

LONDON, S.W.—For the erection of two shops, and alterations to other buildings at Mortlake. Mr. Ernest Pennington, surveyor, Richmond:—

W. N. Street ...	£1,525
Hughes & Co. ...	1,450

* Accepted subject to modifications.

NEW BARNET.—For the labour and materials for erecting a fire-engine station and steam-roller house, &c., in Leicester Road, New Barnet, for the East Barnet Valley Urban District Council. Mr. Henry York, surveyor:—

W. Wade, St. Neots, Hunts ...	£1,629
G. Goddard, Jun., New Southgate, N. ...	1,593
Willmott & Sons, Hornsey, N. ...	1,580

* Accepted.

[Surveyor's estimate, £1,530.]

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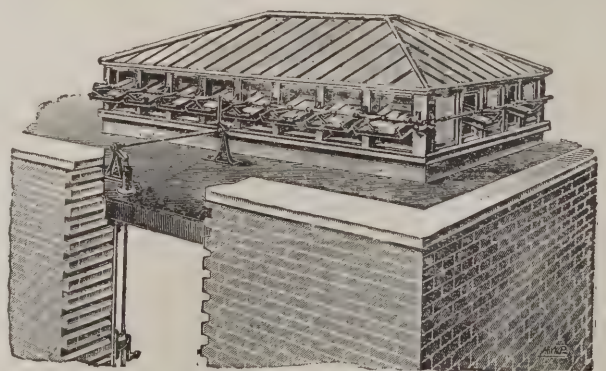
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RANSKILL (YORKS).—Alterations and additions to "The Grange," Ranskill, for Mr. W. H. Otley, of Doncaster. Mr. E. Hall Ballan, architect, Oriental Chambers, Doncaster. Quantities by Mr. Hoffman Wood, Park Square, Leeds:—		
F. C. Close, Doncaster	£1,181	0 4
Mettam, Retford	1,000	0 0
F. R. Swaby	825	0 0
Dennis Gill & Son, Doncaster	702	0 0
C. A. F. Morrison, Ranskill	720	0 0
Robert Stewart,* Blyth	680	0 0
* Accepted provisionally.		
SOUTHOLD (SUFFOLK).—For repairing and extending the north pier at Southold Harbour, for the Corporation:—		
Menel timber.		
G. D. Brettell, The Foregate, Worcester	£1,345	17 6
G. Double, Ipswich	1,160	16 0
J. C. Trueman, Southold	1,120	0 0
T. W. Pedrette,* 84 Bethune Road, Stamford Hill, London, N.	872	16 9
Pitch pine.		
W. King, Southold	977	9 0
J. C. Trueman	920	0 0
* Accepted.		
SUTTON-ON-SEA.—Accepted for the erection of a house for Mr. H. H. Maddock, of Doncaster, Mr. E. Hall Ballan, architect, Oriental Chambers, Doncaster:—		
F. Moore, Sutton-on-Sea	£570	
WEYMOUTH.—For the erection of banking premises in St. Thomas's Street, for the Devon and Cornwall Bank. Messrs. Crickmay & Sons, architects:—		
Crenton & Co., London	£10,182	0 0
Davis & Son, Dorchester	9,728	15 0
J. T. Whettam, jun., Weymouth	9,313	0 0

F. Merrick & Son, Glastonbury	9,097	0 0
E. R. Bartlett & Son, Yeovil	9,045	0 0
Bird & Piquard, Yeovil	8,704	10 0
H. Pittard & Son, Lansport	8,554	13 6
J. A. Bartlett, Weymouth	8,491	18 8
C. H. Green, Blandford	8,390	0 0
J. W. & H. Childs, Yeovil	8,188	0 0
T. Conway,* Weymouth	7,715	8 10
* Accepted.		
WILLENHALL.—For the erection of new classrooms and cloak-rooms at the Short Heath Board Schools, near Willenhall, for the Willenhall and Bentley (U.D.) School Board. Mr. Joseph P. Baker, architect, Willenhall:—		
H. Gough	£1,530	0
R. Speake & Sons	1,492	0
A. Griffiths	1,375	10
J. M. Tildesley	1,460	0
Hammonds Bros., Darlaston	1,423	0
T. Tildesley, Willenhall	1,335	0
J. Wartere, Willenhall	1,300	0
J. Hickin & Sons	1,350	0
F. Mossley & Sons, Willenhall	1,277	15
[Rest of Wolverhampton.]		
WREXHAM.—For the erection of new offices, agent's residence, &c., in Bradley Road, Wrexham, for the Trustees of the Denbighshire and Flintshire Miners' Federation. Messrs. Davies & Moss, architects, 2 Temple Row, Wrexham:—		
Davies Bros., Wrexham	£1,615	0
W. E. Samuel, Wrexham	1,570	0
W. Hughes, Wrexham	1,530	0
R. Roberts, Coedpoeth	1,520	0
E. Williams, Brymbo	1,500	0
S. Moss, Coedpoeth	1,357	10
T. Williams,* Southsea	1,200	0
* Accepted.		

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FORAGE.			
	£ s. d.	£ s. d.	
Beans per qr.	1 18 0	2 0 0	
Clover, best per load	4 15 0	5 10 0	
Hay, best do.	5 5 0	5 12 6	
Sainfoin mixture do.	4 10 0	5 5 0	
Straw do.	1 10 0	2 4 0	
OILS AND PAINTS.			
Castor Oil, French .. per cwt.	1 5 1	1 6 0	
Colza Oil, English .. do.	1 7 6	—	
Copperas per ton	2 0 0	—	
Lard Oil per cwt.	2 12 0	2 12 6	
Lead, white, ground, carbonate do.	1 4 10	—	
Do. red do	1 0 4	—	
Linseed Oil, barrels .. do	1 10 6	—	
Petroleum, American .. per gal.	0 0 6½	0 0 6½	
Do. Russian do.	0 0 5½	0 0 6¼	
Pitch per barrel	0 7 0	—	
Shellac, orange per cwt.	5 8 0	—	
Soda, crystals per ton	3 2 6	3 5 0	
Tallow, Home Melt .. per cwt.	1 12 0	1 13 0	
Tar, Stockholm per barrel	1 2 6	—	
Turpentine per cwt.	1 18 0	—	

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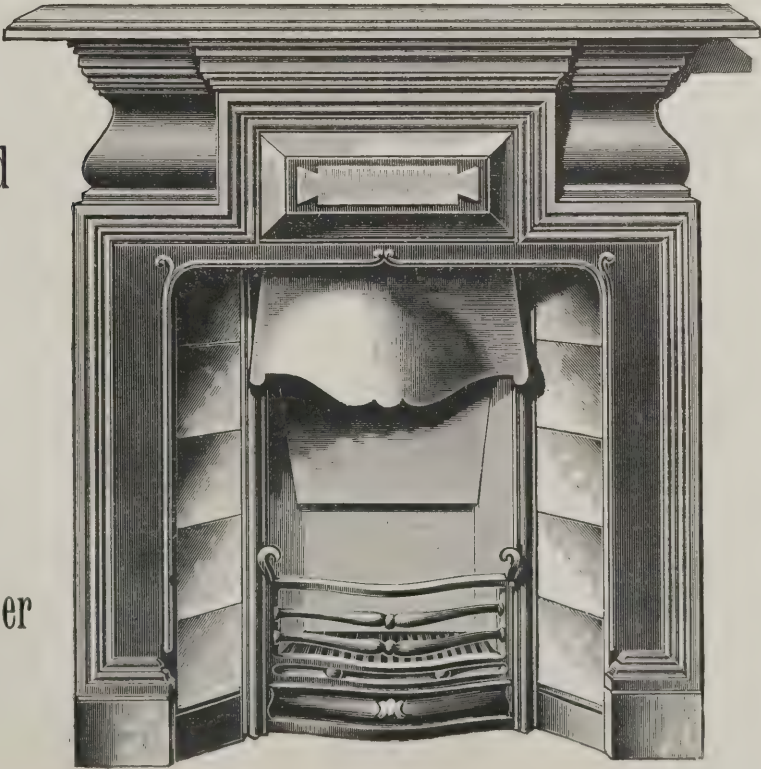
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Copper, sheet, strong .. per ton	69 0 0	—
Iron, Staffs, bar .. do.	6 7 6	8 10 0
Do. Galvanised Corru- gated sheet .. do.	11 10 0	11 15 0
Lead, pig, Soft Foreign .. do.	11 6 3	—
Do. do. English common brauds .. do.	11 11 3	—
Do. sheet, English 3lb per sq. ft. and upwards .. do.	13 5 0	—
Do. pipe .. do.	13 15 0	—
Nails, cut clasp, 3in. to 6in. .. do.	9 5 0	—
Do. floor brads .. do.	9 0 0	—
Steel, Staffs, Girders and Angles .. do.	5 15 0	6 5 0
Do. do. Mild bars .. do.	6 10 0	7 0 0
Tin, Foreign .. do.	130 0 0	130 10 0
Do. English ingots .. do.	131 0 0	132 0 0
Zinc, sheets, Silesian .. do.	21 0 0	—
Do. do. Vieille Montaigne .. do.	21 10 0	—
Do. Spelter .. do.	18 5 0	19 0 0

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SOFT WOODS.		
Fir, Dantzic and Memel .. per load	3 0 0	4 10 0
Pine, Quebec, Yellow .. per load	4 7 6	6 0 0
Do. Pitch .. do.	2 14 0	3 12 0
Laths, log, Dantzic .. per fath.	4 10 0	5 10 0
Do. Petersburg .. per bundle	0 8	—
Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0
Do. do. 4th & 3rd .. do.	8 10 0	15 15 0
Do. do. unsorted .. do.	5 12 6	6 10 0
Do. Riga .. do.	6 15 0	12 10 0

Deal, Petersburg 1st Yellow .. do.	16 5 0	—
Do. do. 2nd .. do.	9 0 0	12 10 0
Do. do. White .. do.	7 5 0	12 10 0
Do. Swedish .. do.	7 15 0	12 15 0
Do. White Sea .. do.	13 5 0	17 5 0
Do. Quebec Pine, 1st .. do.	11 10 0	24 10 0
Do. do. 2nd .. do.	22 5 0	—
Do. do. 3rd & 4th .. do.	9 10 0	—
Do. Canadian Spruce, 1st .. do.	7 10 0	12 10 0
Do. do. 3rd & 2nd .. do.	7 0 0	9 0 0
Do. New Brunswick .. do.	7 5 0	8 0 0
Battens, all kinds .. do.	7 0 0	10 5 0
Flooring Boards lin. prepared, 1st .. per square	0 8 9	0 9 9
Do. 2nd .. do.	0 10 0	0 10 3
Do. 3rd & 4th .. do.	0 7 3	0 8 9

HARD WOODS.		
Ash, Quebec .. per load	3 17 6	4 10 0
Birch, Quebec .. do.	3 12 6	3 17 6
Box, Turkey .. per ton	7 0 0	15 0 0
Cedar, lin., Cuba .. per ft. sup.	0 0 4 5	—
Do. Honduras .. do.	0 0 1 1	—
Do. Tobasco .. do.	0 0 6 1	—
Elm, Quebec .. per load	0 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras .. per ft. sup.	0 0 4 5	—
Do. African .. do.	0 0 3 3	—
Do. St. Domingo .. do.	0 0 5 1	—
Do. Tobasco .. do.	0 0 3 1	—
Do. Cuba .. do.	0 0 4 2	—
Oak, Dantzic and Memel .. per load	3 15 0	5 7 6
Do. Quebec .. do.	4 12 6	7 15 0
Teak, Rangoon, planks .. do.	16 0 0	17 10 0

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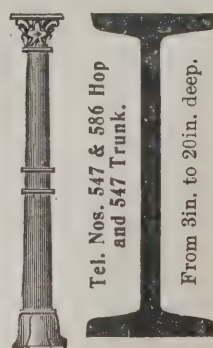
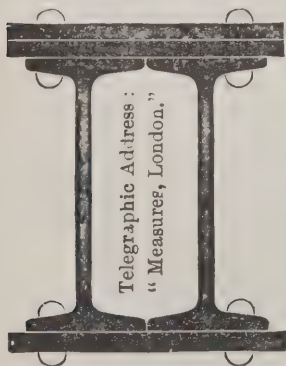
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An Architectural Causerie.

Registration in
America.

WE are able to publish this
week the full text of the Act
which has been passed in New

Jersey, U.S.A., for the State registration of architects. It will be seen that an official board is constituted of five architects who have been in practice for at least ten years, two of whom will hold office for one year and the remaining three for two years. Under the direction of this board examinations will be held twice a year, and the candidates who satisfy the majority of the board will, on payment of £3, be granted a certificate to practise as architects. It will, however, be noted that there are certain exemptions to the examinations; and these exemptions are most important. The first applies if the candidate can refer to buildings erected "from his or her design and under his or her supervision" which shall be considered by the board as sufficient testimony of the applicant's competence to practice architecture. When it is remembered that there are many architects in this country who, by buildings actually carried out, have proved themselves to be thoroughly capable men, yet who might not be able to pass the R.I.B.A. examinations, this exemption in the New Jersey Act will at once be appreciated. It is a most notable feature of the Act, and one which cancels many objections raised against architectural registration. Of two tests of the ability of an architect—one by oral and paper examination and the other by executed works—there can be no question; the latter is undoubtedly the better; and the recognition of this fact in the New Jersey Act shows that it has been framed by far-seeing and well-informed men. Another exemption from the examination is secured by the candidate possessing a diploma for the full course in architecture in any university or technical school approved by the board. The penalties are equally as interesting as the exemptions. If anyone practises as an architect or advertises himself as such without possessing the State certificate he is liable to be fined anything from £10 to £100, or to be imprisoned for not less than a month! It might appear from this that architecture was to be made an absolutely close profession for certificated practitioners. This is not so, however, for the Act says that students or employees of licensed architects may act upon their principals' authority; that anyone may design a building which is to be erected by himself or his employees (thus including the builder); and that anyone may prepare plans and specifications for a building provided the owner is fully aware that he is not a properly registered architect. Finally

there is the request or stipulation that everyone officially qualified should have a round seal about 2in. in diameter with his name and address on it, and the title "Registered Architect" at the bottom; this seal to be used for stamping all plans. At this time of day there is no necessity to go over the old arguments for and against architectural registration. But here is a definite Act drawn up in accordance with the most advanced ideas, and approved by an important American State. We have gone over the main features of this Act, and can now only express the opinion that it is a most carefully-draughted measure, and one likely to prove

anything either to offend or attract, such beauty as exists in its surroundings comes into play; its elevation above the road, the high brick piers surmounted by lions' heads, the wrought-iron gateway through which the house and garden show, the approach broken up by flights of steps, the trees and creepers, and its hillside situation—these and its connection with a past century give the house an individual character sufficient to make it worthy of at least a passing notice. In it the heavy cornice and the high-pitched roof, the brick quoins and dressings to the angles and windows, are abandoned, and the symmetry of the Georgian period remains, together



WANDSWORTH HOUSE. DRAWN BY SIDNEY V. NORTH, A.R.I.B.A.

highly beneficial to the architectural profession whom it concerns. We would commend it to those on this side of the Atlantic who are interested in the matter.

Wandsworth House.

THE few remaining relics of Old Wandsworth are slowly vanishing. Wandsworth House, shorn of its age and situation, and appearing as a nice new modern residence with about 5ft. of forecourt, would be a barren spectacle. It belongs to the early Victorian, or, as Ruskin would probably call it, the "Baker Street" style of architecture. With dead flat skyline and unvaried rows of windows, its merits are of a strictly negative kind. Like the general work of its period, the canon of design by which the builder appears to have been governed was not so much to produce something beautiful as to avoid giving offence by producing anything bad. The house itself being quite innocuous without

with its enriched doorway, the most interesting feature of the house.

A Bricklaying Experiment.

A FRESH question has been asked and answered in regard to the bricklaying problem. It is, "How many bricks can be laid per day per master-builder?" Mr. Councillor Spiller, of Taunton, applied himself to the task. At six o'clock one morning he started to lay a thousand bricks in some houses which he is building at Minehead. Mr. G. Babb, of Minehead, representing the unskilled labourer, carried bricks and mortar. They took an hour for breakfast and had another rest of fifteen minutes for a hasty lunch at 11 o'clock. The thousandth brick was laid at 2.15. So that the work was finished by the two men in seven hours. This is no criterion for the British bricklayer and his 400 bricks a day, but the comparison is at least interesting, and instructive withal.

Correspondence.

"The House of the Seven Gables": A Problem for Architectural Students.

To the Editor of THE BUILDERS' JOURNAL.
SOUTHPORT.

SIR,—Whilst reading Nathaniel Hawthorne's "House of the Seven Gables" it occurred to me that it would be interesting to ask a number of architects or architectural students to put down on paper, from the descriptions given in the book, their idea of the old mansion of the Pyncheons. I therefore went carefully through the book, and took down all those passages which serve in any way to describe the building. When you put them together you are struck with the vagueness of the material you have to go upon, and you wonder how the very vivid impression left on your mind as to the appearance of the house has been formed. There may be illustrations to the story, with some artist's notion of what the House of the Seven Gables was like, but, if so, I have not seen them. But even if there exist such illustrations, they are not all what one would like to see. When you examine Hawthorne's description you will see how much is left to the imagination; and I should like to suggest that the BUILDERS' JOURNAL should invite its readers to send in a plan, with elevations or a perspective, showing their conception of this celebrated dwelling.

Of course to read the book oneself would be the best way to start on the work, but for those who would care to send in a design and who have not the desire to study the book at leisure I herewith transcribe all those passages which have any direct bearing on the building itself.

Hawthorne speaks of it in his day as "A rusty wooden house, with seven acutely-peaked gables, facing towards various points of the compass, and a huge clustered chimney in the midst."

The house was built at the end of the seventeenth century, in the reign of William III. It is, of course, in New England, and is elsewhere described as "a specimen of the best and state-liest architecture of a long-past epoch." It is an "imposing edifice," "a little withdrawn from the line of the street, but in pride, not modesty."

It is a timber building. "Its whole visible exterior was ornamented with quaint figures, conceived in the grotesqueness of a Gothic fancy, and drawn or stamped in the glittering plaster [this is when the house was new] composed of lime, pebbles, and bits of glass, with which the woodwork of the walls was overspread."

"On every side the seven gables pointed sharply to the sky, and presented the aspect of a whole sisterhood of edifices, breathing through the spiracles of one great chimney."

"The second storey, projecting far over the base, and itself retiring behind the third, threw a shadow and thoughtful gloom into the lower rooms."

"Carved globes of wood were affixed under the jutting storeys."

"Little spiral rods of iron beautified each of the seven peaks."

"On the triangular portion of the gable that fronted next the street was a dial."

"The principal entrance, which had almost the breadth of a church door, was in the angles between the two front gables, and was covered by an open porch, with benches beneath its shelter." In another place this door is spoken of as possessing an iron knocker, and the portal as being in carved oak.

"The many lattices, with their small diamond-shaped panes, admitted the sunlight into hall and chamber."

"In front, just on the edge of the unpaved side-walk grew the Pyncheon-elm, which might well be termed gigantic. It gave beauty to the old edifice, and seemed to make it a part of nature."

"The old edifice was surrounded by habitations of modern date [the book was written about 1850], mostly small, built entirely of wood, and typical of the plodding uniformity of common life."

There is mention of the "white-oak frame" of the house, "its boards, shingles and crumbling plaster," and later of its shingled roof.

After speaking of the elm tree, Hawthorne says, "The street having been widened about forty years ago, the front gable was now precisely in a line with it." What "it" refers to I do not quite know. He immediately proceeds, "on either side extended a ruinous wooden fence of open lattice-work, through which could be seen a grassy yard, and, especially in the angles of the building, an enormous fertility of burdocks." This, too, is somewhat obscure.

"Behind the house there appeared to be a garden, which had once been extensive, but was now infringed upon by other enclosures, or shut in by habitations and outbuildings that stood in another street." Of this garden there is further mention later in the book. It is now "contracted within a small compass." There is a grass plot in the centre, "surrounding a ruinous little structure that had once been a summer-house." "The garden was hemmed about partly by high wooden fences, and partly by the outbuildings of houses that stood in another street." In the garden is a fountain "set round with a rim of mossy stones."

"In the front gable, under the impending brow of the second storey, and contiguous to the street, was a shop-door, divided horizontally in the midst, and with a window for its upper segment, such as is often seen in dwellings of a somewhat ancient date." This door had, however, been "cut through" the side of the house subsequent to its erection.

"A crop of flower-shrubs were growing in the nook between two of the gables, not a great way from the chimney."

"Three of the seven gables either fronted or looked sideways down into the garden."

There is little to guide us as to the interior arrangement of the house. We are told of its "passages and apartments," but are nowhere made acquainted with the number of the latter. There is, however, the shop that faces the street, and the parlour, where so much of the action of the story takes place, which is of "moderate size" and looks out on the garden. This is the room where Judge Pyncheon died. It is described as a "low-studded room, with a beam across the ceiling, panelled with dark wood, and having a large chimney-piece." It is, of course, on the ground floor. We are told that Hepzibah, passing from this room through an intervening passage, opened a door that communicated with the shop. "Owing to the projection of the upper storey—and still more to the thick shadow of the elm door, which stood almost directly in front of the gable—the twilight here was still as much akin to night as morning." "Here" probably refers to the passage rather than to the shop, but the words are not very clear.

Looking through the shop-door from the street "through the passage-way there was a dark vista into the interior of the parlour" when the door of the latter was open.

Other rooms mentioned are the kitchen, a "boudoir" on the first floor, Phoebe's bedroom which "looked down on the garden and fronted towards the east," and Clifford's and Hepzibah's bedrooms. Holgrove "lodged in a remote gable—quite a house by itself—with locks, bolts and oaken bars on all the intervening doors." This lodging was "in the northern gable, one of the windows of which had a side view towards the gate of the little back-yard."

There is mention of a "dusky passage-way" inside the front entrance.

Lastly there is the "arched window," which is thus described. The writer is speaking of the inside of the house, and says: "On the second storey of the house, at the termination of a wide entry, there was an arched window of uncommonly large dimensions. It opened above the porch, where there had formerly been a balcony, the balustrade of which had long been removed."

These extracts contain, I believe, all that can directly help to a reconstruction of the House of the Seven Gables. Of how many interpretations will they allow?—Yours truly, F. H. C.

[Dilettantism in architecture is a thing to be avoided, but we think the suggestion made above is one that will do no harm to the student so far as the serious side of his art is concerned, while the requisite interpretation of his imagination into a definite architectural conception will certainly benefit him. We shall therefore be glad to

receive a plan, with elevations or perspective, of the House of the Seven Gables, drawn in pen and ink, without wash or colour work: and to offer a bound volume of "The Architectural Review" (Vol. X.—January to June, 1902) for the most successful attempt. All sketches should be sent in not later than July 21st.—Ed. B.J.]

"Constants of Labour."

To the Editor of THE BUILDERS' JOURNAL.

ERITH.

SIR,—Comparing the "constants of labour" given in your "Building Notes and Memoranda" with those published in Fletcher's "Quantities" (the list in which, I am aware, is admitted by the author to be far from perfect) and other books of reference, and also with notes compiled from my own experience, I find there is a startling difference. Take, for example, slating as given in Fletcher's book and as given by Mr. Coleman. This only shows how difficult it is to compile anything like a trustworthy list of labour constants.—Yours truly,

AUGUSTIN C. PASSMORE.

[There is perhaps no more debatable subject than that of "constants of labour" and the cost of building works generally; an illustration of which may be seen in the recent "Times" correspondence respecting the one item of bricklayer's work. It has there been asserted that a number of bricklayers working upon a chimney at Birkenhead each laid an average of 1,976 bricks per day, whilst another statement has been made that the average number laid by a bricklayer on ordinary work does not amount to 400 bricks per day. A comparison of the respective labour constants for brickwork based upon these separate averages (both of which are given as actual facts) would show even more "startling" differences than those mentioned by our correspondent. To institute a comparison between two such extreme statements without a full knowledge of the conditions under which both were made would be obviously futile. For the same reason, our contributor does not propose to attempt to reconcile any apparent discrepancies which may be found between the labour results set forth as compared with those obtained by each and every other observer under possibly different circumstances. Men are not machines, and from the very nature of the conditions under which labour constants are obtained it must be expected that discrepancies will be found in the labour values as deduced by different observers. For example, if ten or twelve builders were asked to state the exact prime-cost value of brickwork per rod in the same district, it would be possible to obtain just as many different prices. Such differences are frequently "startling," but so far as our own observation extends they are matters of ordinary occurrence. We would point out to Mr. Passmore that the labour constants given in our contributor's article refer to slating laid complete, including gauging, holing, &c.; whilst the constants given by Fletcher apparently refer to "laying only." We are quite ready to reply to any criticism that may be made on these articles, but would observe that it is useless for correspondents to point out that our contributor's figures differ from those in "Laxton" or "Lockwood" or "Spon" or some other authority, all of whom vary from each other; so that it would be somewhat strange if the labour constants given in our columns agreed with them all!—Ed. B.J.]

The Leighton Memorial in St. Paul's Cathedral, which is illustrated on the opposite page, has a pedestal of cippolino marble with black marble base, the sarcophagus bearing the recumbent figure being in bronze. The figure to the left is Painting; that to the right, Sculpture. Some further particulars were given on p. 17 of our issue for February 26th last.

A Memorial of Queen Victoria at Carlisle is now being erected near the Public Park. The statue of the late Queen has been completed by Mr. Brock. It is cast in bronze, and represents her Majesty in imperial robes and wearing an imperial crown. In the one hand she holds an orb, surmounted by a figure of Victory, and in the other a sceptre. The panels of the pedestal, which are of bronze, represent Empire, Education, Science, Art and Commerce.



THE MEMORIAL TO LORD LEIGHTON IN ST. PAUL'S CATHEDRAL. THOMAS BROOK, R.A., SCULPTOR.

LOUISIANA PURCHASE EXPOSITION, 1903.

SOME PARTICULARS OF THE BUILDINGS.

THE great exposition by which the citizens of the city of St. Louis, U.S.A., will commemorate the Louisiana Purchase is now thoroughly in hand, and is being worked out in all of its details by the different departments.

A commission of architects has been formed, in doing which the Committee on Grounds and Buildings appointed by the Exposition Company deemed it best to select certain well-known men and firms in the architectural profession to design the main buildings.

After the general scheme for the main buildings had been determined upon, the individual buildings were assigned to the firm or to the architect who was to design them.

A comparatively level plain about half a mile wide and one mile long in the west end of Forest Park was selected for the placing of the eight principal vast structures for the fair purposes. This plain is bounded on the south by hilly and much broken ground. A range of hills runs nearly parallel with the plain from east to west. This line of hills is 70ft. above the plain, and it was finally determined to place some striking building at the point on the hill which would be on the main axis of the picture, and from which point radiating lines would form the main boulevards in a symmetrical manner. It was determined, after placing the Art Hall and Festival Hall in the centre to be flanked with two extensive and ornamental buildings for public service on either side, to form the slope of the hill in front into one grand feature to be developed in the fullest manner by the art and skill of the landscape architect. The hill that receives the Festival Hall being very nearly semicircular on plan, and about one-quarter of a mile wide, it was decided to terrace the slopes, forming hanging gardens, walled footways and flower beds, and to construct three cascades pouring their waters from the top of the hill down into a grand basin at the foot.

In grouping the buildings every effort was made to obtain the most pleasing vistas and perspective effects, not only for the individual building but in combination with all its surrounding structures. To balance the Art Hall and Festival Hall was placed the vast Government building on the axis of the main street at the east end of the picture.

On the centre axis is a lagoon 300ft. wide and 1,700ft. long, and to the right and left are waterways 75ft. wide, spanned by ten bridges.

Certain established theories in construction and materials it was thought best to follow, and consequently the fine palaces that will constitute the main buildings for exposition purposes will be built of heavy timber construction covered with staff and plaster, the staff being used for all exposed surfaces, where ornamentation and constructive details are to be developed.

After mature consideration it was not deemed advisable to use the enormous steel trusses and steel construction as developed in the Liberal Arts Building and Machinery Building at the Chicago Fair, both from the danger of the possibility of the non-delivery of materials in time, and with the knowledge that the vast and useless enclosure far above the ground levels added nothing to either the interior or exterior effects of the buildings. It was decided to use well-designed and thoroughly strong wooden trusses for the main spans of all the buildings. These trusses are mostly from 40ft. to 110ft. in length, and by being placed at an appropriate and at the same time amply high elevation from the ground floor will afford a spacious, well lighted and a well-manageable enclosure for all exposition purposes, and also will afford a better opportunity for architectural decoration in connection with the many valuable exhibits that will be placed in the buildings. It was thought wise to keep the cornice line of the buildings at a uniform height of 60ft. from the ground level. This affords ample height for perspective effects when the high-pitched roofs are taken into consideration.

A somewhat novel treatment in the construction of the four buildings on the main axis of the picture is developed by the introduction of large courts in the centres of the buildings. The

architects have taken these features well in hand, and have produced some very striking and pleasing effects. Rich gardens and elaborate fountains will adorn these courts, and under certain exigencies many exhibits can be placed in them, with appropriate and graceful shelters to be designed for protection.

The Art Hall is very happily treated by its architect in one well-balanced mass, but so divided as to enable him to produce a thoroughly fireproof construction throughout. It will have a marble exterior for the central feature, which will contain the gems of the art collection and will remain as a permanent structure on the World's Fair site as a legacy. The State of Missouri will also build an elaborate structure of permanent fireproof construction, marble and stone of the State to be exclusively used in its construction for walls and decorative features. This will leave two monuments in Forest Park after the temporary structures are removed.

About two hundred acres of ground will be added to the ground in the park for fair purposes. On this will be placed the enormous Agricultural building, the Horticultural building, Dairy buildings and the vast stock barns and sheds. A special effort will be made to design the Agricultural and Horticultural buildings in a novel and striking manner, and commensurate with the vast industries which they will represent. They will be built of wood, lined with plaster and staff similar to the other palaces for exhibits.

The vast array of buildings by foreign Governments, and those to be erected by the different States of the Union, will in all probability be placed either on the plain just north of the main Exposition buildings or on the wooded heights south-east of the Art Hall. It is understood that many of the States will construct much more elaborate buildings than ever before for similar purposes, and several are now considering the advisability of permanent structures to be given to the city at the conclusion of the fair. Mr. Isaac S. Taylor is director of works.

The system of construction adopted in the Varied Industries building (an illustration of which is given in our centre plates this week) is the same as that for all the buildings of the big exhibit group. For instance, in the Varied Industries building the roof-trusses will be of long-leaf southern pine, except those small portions which will be under tensile strain, and these only will be of iron or steel. The building will have an area of 569,000 sq. ft.; two interior open courts have an area of 121,000 sq. ft., leaving a nett area of the building under roof of 448,000 sq. ft., or 10.3 acres. The north front is formed by two straight lines, each 600ft. in length, meeting at the middle of the whole front in a salient angle of 150 degs. The south front is parallel to the north front, and is of two lengths of 459ft. 4in. each, making a re-entering angle of 210 degs. at their junction. The mean length of the building is 1,060ft.; the width 525ft. The exterior shows a continuous line of colonnade, with the exception of the west front and the west half of the north front. At the salient angle of the north front, forming its central feature, is a tower 350ft. in height; at the re-entering angle of the south front, opposite the tower, is a dome 160ft. in height. Corner pavilions, monumental main entrances at the east and west fronts, smaller turrets flanking the main tower and dome, a portico in front of the main tower, and an open columniated screen

segmental on plan, in front of the dome, complete the architectural conception of the building.

A dome-shaped roof, forming part of the façade, rises to an additional height of 24ft. above the cornice line, giving a total height of 84ft. of vertical exterior surface exposed to the wind.

The building in its width is divided into seven bays of different spans, varying from 45ft. to 105ft. Two interior courts cut out the three middle bays, and at either side of these courts are two spans. In this part of the building the lateral wind force has to be resisted, for every 30ft. of its façade length, by three posts and the two roof-trusses resting upon them.

Posts, braces and trusses are constructed for the maximum stresses either due to the dead-weight strains alone or to the combined dead-weight and wind strains. The resulting strength of these parts is carried through from end to end of the building, and no allowance is made for wind stresses in the three middle bays opposite the courts, where the whole width of the building is under roof. The knee-braces as well as the web-members of the two outer roof spans are constructed to act either as struts or ties, as the direction of the wind from opposite sides, together with the dead weight, may require. In the other direction, crosswise to the trusses, the posts are braced together by Howe trusses from end to end of the building. Every other pair of the main roof trusses is braced together by vertical cross-bracing trusses and by diagonal laterals in the plane of the top chords of the main trusses. Trussed purlins span from truss to truss, where no cross-bracing trusses occur, and from one truss-pair to the other. The main trusses are 30ft. apart longitudinally.

The clear height from ground floor to lower chord of trusses is about 70ft. under the middle span of 105ft., and about 60ft. under the other six spans.

Only in the case of the sloping roof along the interior court walls do the rafters rest directly upon the purlins; in all other cases the rafters of the deck roofs are carried on girders and posts placed on top of the main trusses, or on trussed purlins and cross-bracing trusses.

The splices in the bottom chords are made with steel plates. Shoulders in the form of flat bars riveted to the plates, and bolts through plates and timbers, transmit the stresses through the plates from timber to timber. Enough shoulder area is provided to take the greater part of the stresses; the number of the bolts is limited to what was deemed necessary to bolt and pack the splice-plates firmly into the grooves of the timbers. The value of the bolts for transmitting chord-stresses from timber to splice-plates, or *vice versa*, is limited to their capacity governed by the transverse stresses of the bending moment in each special case.

Where more than one shoulder (lug) to one side of the timber-joint is found necessary, it is generally arranged to have the second shoulder of greater depth than the first, so that the two shoulders shear on different layers of fibre. The same method has been followed wherever castings are used.

The sheltered location of the buildings warrants the assumption of 20lbs. for the wind-pressure.

The main floor is laid with 2in. plank on 4in. by 4in. sleepers on the graded ground. A gallery 48ft. wide, 21ft. above the ground floor,

The following is a list of the big exhibit buildings:—

Name.	Cost.	Dimensions.	Architect.
Art Building	£200,000	830ft. by 450ft.	Cass Gilbert.
Mines and Metallurgy	100,000	525ft. by 750ft.	Theodore C. Link.
Liberal Arts	92,000	525ft. by 750ft.	Barnett, Haynes & Barnett.
Textiles	64,000	600ft. by 525ft.	Bames & Young.
Manufactures	169,000	525ft. by 1,200ft.	Carrere & Hastings.
Electricity and Machinery	80,000	600ft. by 525ft.	Walker & Kimball.
Varied Industries	120,000	525ft. by 1,200ft.	Van Brunt & Howe.
Machinery	134,000	525ft. by 800ft.	Wildman, Walsh & Boisselier.
Transportation	140,000	525ft. by 1,300ft.	Dept. of Works Designers.
Agriculture	160,000	500ft. by 1,600ft.	Isaac S. Taylor.
Forestry, Fish and Game	70,000	400ft. by 600ft.	Dept. of Works Designers.
Horticulture	40,000	300ft. by 1,000ft.	" "
Education and Social Economy	70,000	400ft. by 600ft.	" "
Government Building	50,000	850ft. by 140ft.	J. Knox Taylor.
Live Stock Barns and Sheds	20,000	25 acres	Dept. of Works Designers.
Horticulture Fields	—	500ft. by 400ft.	" "

runs around the entire building near the outside wall. It is supported on 8in. by 8in. posts, 15ft. centre to centre in both directions; 8in. by 10in. girders, and 2in. by 10in. joists, 20ft. on centres, with a double 4in. floor.

This gallery extends to the centre part of the building and connects with the second floor in the central pavilion separating the two courts.

All foundations of skeleton walls and truss-posts rest on cribbage footings.

The assumed roof load is 15lbs. for snow, 15lbs. roof-covering, sheathing and rafters; 10lbs. purlins, lateral and cross bracings and trusses; total, 40lbs. per sq. ft. Total gallery load, 80lbs. per sq. ft.

The main tower is constructed of timber, steel tie-rods and splice-plates, bolts and connection castings. Its main shaft is octagonal on plan (about 48ft. on the short diameter) and is surmounted by an open rotunda of sixteen columns, with entablature and conical roof; the latter is topped off with a lantern and statue. The height from rotunda deck to foot of statue is about 100ft.

The tower below the main cornice line is square on its general plan. Four corner piers and two intermediate pairs of columns in each side of the square form the supports for a height of 50ft. from the ground. No cross-bracing between the individual supporting legs is possible for this height of 50ft. A shaft is kept open in the centre for the installation of a pair of elevators. The corner piers, which are really principal supports, because the only ones that afford an opportunity for the so very necessary lateral bracing against the wind-pressure, are well outside of the corner posts of the octagonal shaft above. The weight and the wind-pressure uplift respectively, of the octagonal frame above is transmitted to them and to the posts placed inside of the plaster columns by a system of four principal trusses, each carrying two of the corner-posts of the octagon, and the four together also carrying four inner posts of the octagon. These trusses rest on four distributing trusses placed along the four sides of the supporting square below.

Each corner pier is framed of four 14in. by 14in. posts, spaced and braced together in all directions. These posts extend to about 14ft. above the architrave line of the entablature to afford a chance for bracing all four corner groups together, so that each group forms not merely a pillar but a "cantilever" pillar of a strength to resist the bending moment (at the architrave line) produced by the reaction to the lateral force taking effect at the foot of the pillar in addition to the compressive stress due to the combined dead weight and wind-pressure on the leeward side respectively, in addition to the tensile stress due to the uplift overbalancing the dead weight on the windward side.

cantilever to the windward and the tension chord of the cantilever to the leeward; the stress produced by the one is neutralized by the other. The load coming on these inner posts is also quite inconsiderable, but the presence of these posts is necessary and they must be of the same dimensions as the outer posts, as they have to receive the ends of the diagonal braces and the tie rods, and this practically determines the size of these posts.

The cantilevers in general are built on the Howe style, double diagonal timber struts in both directions, horizontal steel tie-rods. The diagonal struts abut against shaped-bearing blocks let into the post deep enough to give enough end-bearing for the vertical component of the strut stress. The ties are upset steel rods with cast-iron washers. At each panel point of an outer post there are four struts abutting and two tie-rods going through the post; at each panel point of an inner post there are as many as eight struts abutting and four tie-rods going through the post.

The posts are detailed in two-panel lengths, and the joints of the outer posts are spliced with steel plates, lugs and bolts, to transmit the tensile stress on the windward side. Posts are 10in. by 10in. at the top end, and increase to 14in. by 14in. at the lower end of the cantilevers. The struts are all double timbers, interlocking and bolted where they cross, and spiked to cleats on connection blocks. Struts are double 3in. by 6in. in the upper panels and 4in. by 8in. in the bottom panels. The two pieces are latticed together with 1in. by 6in. boards throughout their lengths. Tie-rods are 1/2in. diameter at the top and 1 1/2in. near the bottom, with upset ends.

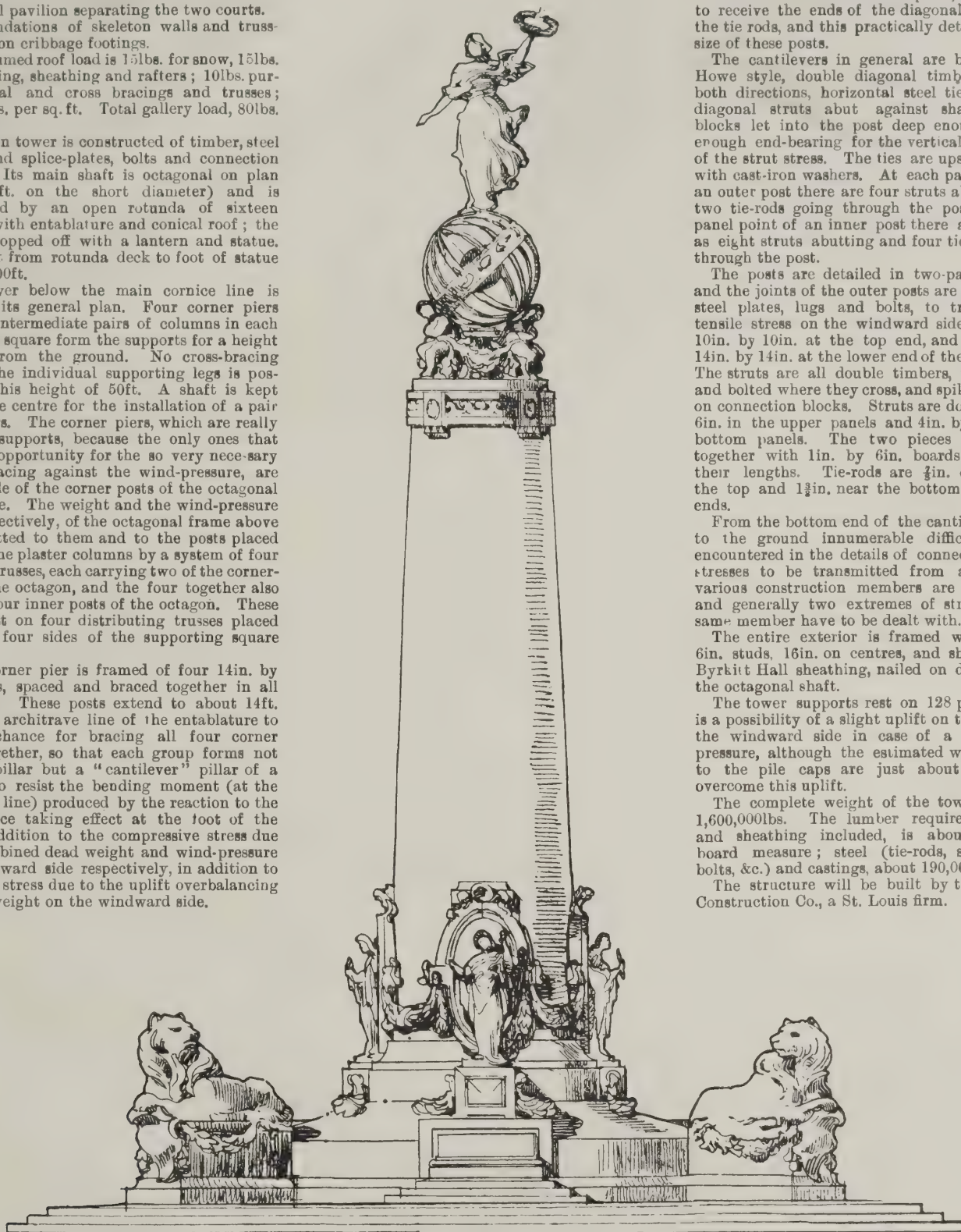
From the bottom end of the cantilevers down to the ground innumerable difficulties were encountered in the details of connections. The stresses to be transmitted from and to the various construction members are stupendous, and generally two extremes of stresses in the same member have to be dealt with.

The entire exterior is framed with 2in. by 6in. studs, 16in. on centres, and sheathed with Byrkit Hall sheathing, nailed on diagonally at the octagonal shaft.

The tower supports rest on 128 piles. There is a possibility of a slight uplift on these piles on the windward side in case of a 20lb. wind-pressure, although the estimated weights down to the pile caps are just about enough to overcome this uplift.

The complete weight of the tower is about 1,600,000lbs. The lumber required, studding and sheathing included, is about 400,000ft. board measure; steel (tie-rods, splices pins, bolts, &c.) and castings, about 190,000lbs.

The structure will be built by the Rountree Construction Co., a St. Louis firm.



THE LOUISIANA TERRITORY MONUMENT FOR THE PURCHASE EXPOSITION, 1903 (Copyright). DESIGNED BY E. L. MASQUERAY.

The horizontal reaction at the foot of each corner pillar (group of four posts) is one quarter of the total wind-pressure against the tower, since the intermediate supports placed inside the staff columns can only be counted as taking part of the vertical strains.

The octagonal shaft which rests on top of the above-mentioned four trusses is framed as two systems of upright cantilevers, the two systems at right angles to each other. Each system comprises two lines of three cantilevers in series

across the octagon, and two cantilevers in the outlying sides of the octagon, making eight cantilevers resisting the wind-pressure in their direction. The similar second system of eight cantilevers meets the wind-pressure in the other direction. These cantilevers are built in eight panels, length of panel about 18ft., the average width about 15ft. 6in.

The wind-pressure is distributed over these eight cantilevers *pro rata*. Each one of the four inner posts is the compression chord of the

Artificial light and heat for the purposes of illumination, as a means of decoration, and as applied to industrial and domestic service are to be made a leading feature in the St. Louis Exposition. More especially is this so in regard to electric light and heating. Those in Great and Greater Britain interested in the subject should communicate by letter to the resident representative of the St. Louis Exposition, Mr. George F. Parker, Sanctuary House, Tothill Street, Westminster, S.W.



LONDON CITY AND MIDLAND BANK, RIPON. BEDFORD AND KITSON, ARCHITECTS.

THE SIR JOHN CASS INSTITUTE.

THE Sir John Cass Technical Institute, which is situated on the east side of Jewry Street, Aldgate, E.C., was opened recently. The building is constructed of red bricks faced with white stone, and has been built from the designs of Mr. Arthur W. Cooksey, A.R.I.B.A. It consists of three storeys. On the basement floor the physics department, the metallurgical department and the workshops are accommodated, together with the boiler-house and men's cloak-room. The physics department comprises two laboratories, one for elementary and one for advanced students, together with a preparation-room, which adjoins the large lecture theatre. The equipment when completed will comprise all the necessary requirements for the teaching of the chief branches of physical science. The lecture theatre, which is entered from the ground floor, will accommodate 250 persons.

In the metallurgical laboratory the equipment is sufficient to accommodate twelve students at a time, and comprises a set of five wind furnaces, muffle furnaces and working benches. An electrical supply will also be furnished to the laboratory for experiments in electro-deposition and electrolytic analysis. The art-metal workshop has a very complete equipment of the various tools and appliances that are necessary for this craft. The administrative offices are situated on the ground floor, together with the rooms for drawing, design and modelling. The last, which are very well lighted, are situated on the south side of the building; they are divided by movable partitions so that they can be thrown into one large room 70ft. in length for purposes of exhibitions or meetings. The library, reading-room, social rooms both for men and women, refreshment-room and five classrooms are situated on the first floor. The school of domestic economy occupies the west side of the second floor, whilst the east side is taken up by the chemical department and classrooms. The domestic economy school includes a laundry, a cookery school and dressmaking room, each of which is fitted with the necessary requirements for its work. An interesting feature in the arrangements of the laundry is that the washing troughs are arranged to face the centre of the room instead of being placed against a wall; this has the advantage of allowing the teacher to see all the work from a central position in the room. The chemical department comprises a laboratory, balance-room, preparation-room and lecture-room, together with a small store-room. The accommodation of the laboratory is sufficient for thirty-five students working at a time. It is provided with suitable draught places, and

the benches are all fitted with an ample supply of gas and water. The water-wastes from the benches, and the ducts for the removal of fumes from the draught-places and from downdraughts on the benches, are made of earthenware, and are so arranged as to be readily accessible. The working benches have been cleared of the ordinary shelves for reagent bottles, so as to allow a clear and uninterrupted view across the whole laboratory. Above this floor and on the south side of the building is the gymnasium, a fine room measuring 75ft. by 35ft., to which a suitable dressing-room is attached.

London City and Midland Bank, Ripon.—This bank, illustrated on this page, is built at the junction of Westgate and High Skelgate, just off the Market Place, Ripon. It is constructed of Morley stone, with a red-tiled roof. The banking-room is 48ft. by 16ft., connected with the street by an oval-shaped lobby; the strong-rooms are below, and the upper storey is occupied by the caretaker's rooms. Messrs. Bedford & Kitson, of Leeds, were the architects.



THE BANKING-ROOM.

Bricks and Mortar

APHORISMS FOR THE WEEK.

The work some praise, and some the architect.
MILTON.

A work of art may deserve all possible approbation without affording any special renown to the artist.—LESSING.

Our Plates. SOME particulars of the Church of the Holy Cross, Ardoy, Belfast, are given on p 297 of this issue, and some of the Building of Varied Industries for the Louisiana Purchase Exposition, 1903, on p. 292.

An Eminent American Architect.

MR. JAMES BROWN LORD, one of the most brilliant of the New York architects, died recently. Mr. Lord was of a distinguished family, his grandfather having been a famous lawyer, while his mother was daughter of James Brown, the founder of the banking-house of Brown Brothers. He graduated at Princeton University in 1879, and immediately began the study of architecture, under William A. Potter. On beginning practice on his own account he found ready employment, and designed many public and private buildings, including the two Delmonico buildings; the White Plains Insane Asylum; the Babies' Hospital, and the new and magnificent Appellate Court-house in Madison Square. This beautiful building deserves to rank among the notable works of American architecture.

Art Study in Italy.

HIS MAJESTY'S CHARGÉ D'AFFAIRES at Rome has sent to the Foreign Office the law regulating entry, without payment of the ordinary fee, to the national museums, galleries, excavations and monuments of Italy, which has been approved by the Royal decree of April 13th, 1902. The privileges of free entry is by the law accorded to foreigners who are (a) artists; (b) art students and art critics who have issued noteworthy publications; (c) professors of archaeology, history, literature and art; (d) pupils of archaeological, historical and art institutions, students in the departments of literature and philosophy, and in schools of practical engineering. Applications for a general permit for free entry to all museums, &c., must be sent to the Ministry of Public Instruction on stamped paper of 1 lira 20c, with an unmounted photograph (of the applicant) not to exceed 5 centim. by 8 centim. in size. Applications for free entry to archaeological and artistic institutes in a single town must be sent on stamped paper of 60 centimes to one of the head of the

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, June 25th, 1902.





HOLY CROSS CHURCH, ARDOYNE, BELFAST: FROM THE WEST.

The late WALTER G. DOOLIN, F.R.I.B.A., and R. M. BUTLER, Architects.

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Wednesday, June 25th, 1902.

· BUILDING · OF · VARIED · INDUSTRIES ·
· LOUISIANA · PURCHASE · EXPOSITION ·
· 1803 · ST. LOUIS · MISSOURI · 1903 ·
· VAN · BRUNT · & · HOWE · ARCHITECTS · KANSAS CITY MISSOURI





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stitutes, and if the permit is required for more than a month a photograph must be sent of the size mentioned in the preceding paragraph. The applications must be accompanied by the following documents:—For persons under (a) and (c), by an academical document *visé* by the Italian Diplomatic Representative or Consul in the country to which the applicant belongs, or by the Diplomatic Representative of that country in Italy. For persons under (b), by one of the publications which they have published. For persons under (d), by an official document showing that they stand on the books of the institutions mentioned under that heading for the year in which they apply. The documents must be *visé* as in the case of the documents furnished by persons under (a) and (c). As his Majesty's Diplomatic Representative in Rome is not always in a position to authenticate without previous inquiry documents issued by institutions in the United Kingdom, art students, &c., are recommended to have such documents countersigned by the Italian Consular officers in this country before leaving.

The Boadicea Monument. The bronze statuary group of Queen Boadicea and her two daughters has been got ready for the Coronation. The group stands on a granite base at the Westminster Bridge end of the Victoria Embankment, immediately opposite Big Ben. The group was designed by the late Mr. Thomas Thornycroft, and the son of the sculptor offered it to the County Council on the condition that a permanent site should be found for it in a public place in London. Mr. W. Bull, M.P., formed a committee, and guaranteed to raise some £2,000 in order to have the model cast in bronze, and he urged the Council to expend about a similar amount on a suitable pedestal. The Council found that in spite of Mr. Bull's generous offer to raise half the cost they had no power to spend public money on such objects at all. This was felt to be an anomaly in view of the Council's responsibility for maintaining the Thames Embankments, on which at the time of their construction it was understood many monuments would be erected. Parliament was appealed to, and it "empowered the Council to purchase, or contribute towards the cost of purchasing, or otherwise to incur expenditure in connection with the provision and erection of works of art in the County of London." That is how London comes into possession of the Boadicea statuary group. Opinion, even among artists, is divided as to its merits. The three female figures and the two horses, all of heroic size, were modelled in clay and afterwards cast in plaster. Mr. W. B. Richmond, A.A., in a letter read before the County Council, said: "It is, in my opinion, quite worthy of so important a position, and it will do honour to that noble site. I have known the work for many years, and have always recognised its merits." Other Royal Academicians, however, are believed to have influenced one or two County Councillors to oppose accepting the group.

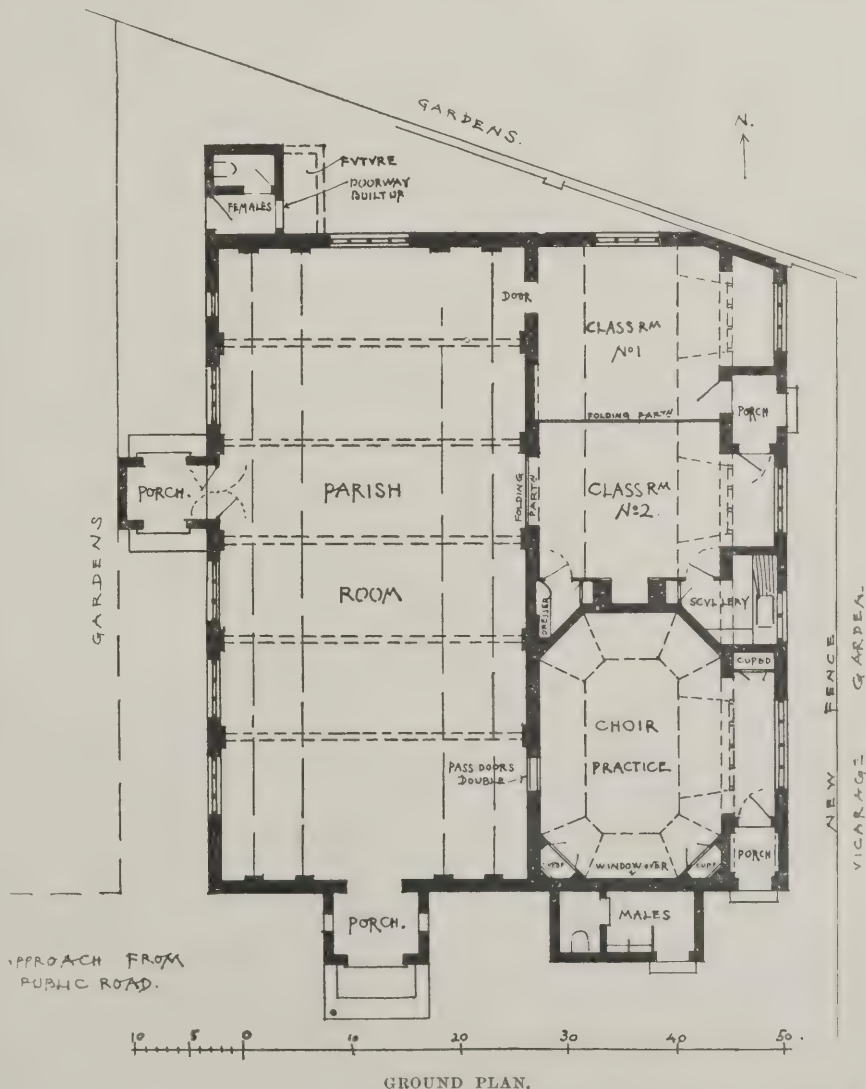
The Architectural Museum. The annual general meeting of the supporters of the Royal Architectural Museum and Westminster School of Art was held last Thursday afternoon at the museum in Tufton Street, Westminster. Mr. William Emerson, the resident, being in the chair. The report stated that during the past year the council had been obliged to undertake the entire renovation of the glass roofs of the older portion of the building, together with the repair of the front parapet and other parts of the fabric. The total cost of the work was £700, and to assist in meeting the outlay the sum of £350 had been advanced by the Technical Education Board of the London County Council without interest, repayable in four instalments to be deducted from the annual grants made by the board to the school of art. The evening classes, except the men's life class, had still further declined during the past year, owing, doubtless, to the increase in the number of drawing classes established in various parts of London at nominal fees, and even without payment. On the other hand, the grants received from the Board of Education for the session 1900-1901 amounted to £206, or upwards of



PARISH ROOM AND SONG SCHOOL, ST. BENET'S AND ALL SAINTS', KENTISH TOWN, N.W.
HARRY SIRR, ARCHITECT.

£30 in advance of the grant for the session 1899-1900. The financial statement showed an excess of expenditure over income for the year of £157. The chairman, in moving the adoption of the report, said that deficit was largely accounted for by the repairs which were undertaken during the year. The school continued to be appreciated by advanced students and artists of high standing, and he was confident that it was doing a good work. Mr. Emerson was re-elected president, and the vice-presidents, with the committee and other officers, were re-appointed.

Parish Room and Song School, St. Benet's and All Saints', Kentish Town, N.W. — The foundations of an old room were to be utilized, and these regulated the shape of the parish room. The rooms are arranged so that they may be thrown open in a convenient way for parochial gatherings. The outside walls are to be rough-cast externally, the roofs to be covered with green slates. The commencement of building operations was arrested in consequence of serious and urgent work required to the structure of the church.



HARROGATE TOWN HALL COMPETITION.

THE competition for new municipal offices recently held by the Corporation of Harrogate has resulted in eighty-one sets of drawings being received. Many of them are of considerable merit, but not a few exhibit a total absence of lucid and intelligent conception of the principles regulating a plan for a building of this nature. The drawings were adjudicated upon by Mr. J. Macvicar Anderson, F.R.I.B.A., of London, who recently gave his decision, awarding the first premium of £150 to Mr. Henry T. Hare, F.R.I.B.A., of London; the second of £100 to Messrs. Waddington, Son & Dunksley, of London; and the third of £75 to Messrs. Heazell & Son, of Nottingham.

The plan of the first premiated design is at once isolated from its competitors by a boldly-conceived corridor, spacious in width, and almost monumental in appearance. The various rooms on the ground floor are thus brought into close relation with one another, facilitating as much as possible the intercommunication of the several departments, and giving a readier access to each by the public. Whilst commendable for these reasons, this arrangement, as other features of the plan emphasize, has obvious disadvantages, not the least of these being the comparatively great number of rooms arranged without external light other than that derived from the top; this expedient is used in the lighting of the entrance hall, corridors, magistrates' retiring, witnesses', magistrates' clerk's and jury's rooms, private rate office, councillors' lavatory, council-chamber, and county court; other rooms are also partially top-lighted; and one is inclined to conclude that such a generous provision of skylight will prove objectionable in a severe rain or hailstorm, or during extremes of temperature.

Contrary to the great bulk of the plans exhibited, this scheme provides the stipulated accommodation upon the ground floor—including the principal rooms of the library department; thus comparatively few rooms are needed on the first floor, and these are located on the south frontage; but the arrangement, whilst economising the cubical contents, results in a somewhat objectionable rear elevation of the rooms at the upper level.

Those conversant with the practical working of municipal offices recognise the necessity of placing the committee-rooms close to the council-chamber, and this has been effected in the plan under notice. The question of sanitary accommodation to the several departments on the ground floor does not appear to have been sufficiently considered. Only two w.c.'s are provided, and these are placed in the basement and are only reached by passing down a staircase to which no natural lighting is provided. This undesirable feature needs modification. The library block is separately entered from Victoria Avenue, and whilst spread over two floors is well adapted for efficient working and public convenience. The rate office is entered from Raglan Street; in practice its counter-space would prove insufficient. Whilst all the principal rooms are laid off in lines at once simple and straightforward, one receives the impression that the subsidiary portions of the plan show an absence of that matured consideration which their importance in the aggregate demands. The court is well arranged, but provides no sanitary accommodation for the public. The galleries to the court-room and council-chamber are entered by a circular staircase common to both, direct from Raglan Street, a feature excellently devised and conducive to the satisfactory working of these departments.

The accommodation provided in the basement requires simplifying to approximate to a satisfactory plan. The elevations are well drawn, and are designed with a dignity and breadth of treatment one instinctively associates with a building of this nature; but the upper portion of the tower is sadly reminiscent of a graveyard monument. The author estimates the cost at £39,750, upon the basis of 10d. and 2s. 6d. per ft. for the building and tower respectively.

Whilst the strongest point of the first premiated plan appears to lie in the small extent of corridor, the designs placed second and third are generously endowed with inter-

communication space. The design occupying the second place is correctly laid off on clearly-defined lines separating the municipal court and library departments, but the external treatment is unpleasantly devoid of unity. The angle tower is admirably conceived and well designed, although its position is open to question. The central axis of the plan runs through the council-chamber and court-house, with the necessary secondary rooms grouped round in a fairly satisfactory manner. The corridors to the ground and basement floors have no direct light, and the objectionable expedient of borrowed lights and glass-door panels is of necessity resorted to. Following the lines of the first design, the library block is distributed over two floors, with the entrance from Victoria Avenue, but the location of the librarian's room is such that he can exercise only a partial supervision over the public. No general lavatories are provided; and, though the subject is a controversial one, there can be no doubt that in a superior residential town like Harrogate such accommodation is not only desirable but absolutely necessary.

The principal entrance is from Station Parade, entering into a large hall possessing a prolixity of glazed screens, which—whilst providing the councillors with a sort of discussion lobby—have a tendency to be confusing to the public, and, unless carefully treated, would be suggestive, with the addition of a few palms, of a winter garden. Whilst a careful inspection of the plan reveals many good features, they are to a great extent discounted by much that is defective. The authors' estimate of £39,882 is allowing 6½d. per ft. for the basement and 1s. per ft. for the superstructure.

The third premiated design shows a well considered plan, placing the apartments of the mayor and council, committee-rooms, council chamber and town-clerk's offices to the south frontage, an arrangement which has much to recommend it. Similarly to the other placed designs, the entrance to the library is in Victoria Avenue, this department being located on the first floor: its arrangement, apart from a few minor defects, is well considered and in practice would prove convenient in working. The town-clerk's offices are admirably planned in detail. The secondary rooms to the court leave much to be desired. The position of the magistrates' room looking into an area is unsatisfactory, and the jury's room is too distant from the court. The spacious hall has a superficial area out of proportion to that of the rooms it serves. The elevations have been carefully developed with a satisfactory result—with the exception of the main entrance portico, which is suggestive of Wesleyan chapel architecture of forty years ago. The cost is estimated at £39,855, at 10d. per ft., but this is exclusive of furnishing to the council-chamber, court-house and library.

Engineering Notes.

The Illumination of the Bank of England will cost £6 an hour: 30,000 gas burners are employed.

Street-Lighting in Bombay.—A motion was recently before the Bombay Municipal Corporation "that the Commissioner be requested to arrange for lighting the street lamps on the nights of all total eclipses of the moon."

London University Appointments.—Professor Capper has been appointed teacher of mechanical engineering at King's College; and Professor Unwin, F.R.S., teacher of civil and mechanical engineering at the Central Technical College and at the London School of Economics and Political Science.

Electric Trams at Yarmouth.—The Corporation electric tramways at Yarmouth have begun running. Six miles of track have been laid. The overhead trolley system is adopted, at a total cost of £50,000. The rails are of Belgian manufacture, but the cars and all the rest of the equipment are British made.

The City and Surrey Electric Railway Company, which has already obtained its powers from Parliament, has acquired a City terminus in King William Street, and a working agreement has been entered into with the South London

Company for the joint use of the tunnel under the Thames. Starting from King William Street, the route proposed is parallel to that of the existing South London line to a point a little south of the Borough Station, then branching westward through St. George's Circus by Lambeth, Kennington, the Oval and Lorne Road to Brixton. From there the line will pass through Balham, Norbury, Thornton Heath and Croydon to Waringham. One branch then proceeds east to Westerham, and the other west to Redhill and Reigate.

A New Suspension Bridge at Stanhope, Durham, has been erected to replace an old trestle-one across the River Wear near Unthank Hall. The bridge, which is for pedestrian and light traffic only, has a span of 86ft. from centre to centre of standards, the platform being kept clear above the highest flood level. Each of the standards are firmly rooted in large masses of concrete and also strengthened and armoured by galvanised steel angle bars specially made by Messrs. Bartram & Sons, of South Dock, Sunderland. The standards, platform, handrail and palisade are of Haskinised pitch-pine, practically unshrinkable and imperishable. The steel wire galvanised cables and undergirders and lattice, together with the galvanised iron clamps and suspension rods, were specially manufactured by Messrs. Glaholm & Robson, of Hendon Patent Ropeworks, Sunderland. Mr. William Davison, of Southwick, was the contractor and builder. The bridge, although of extremely light construction, is remarkably rigid, a quite uncommon feature in suspension bridges generally. This stiffness is due to the scientific application of counter-tension as a substitute for dead weight. The designer, Mr. Frank Caws, F.R.I.B.A., of Sunderland, previously introduced the same principle successfully in the suspension pier at Sea View, in the Isle of Wight, where three of its spans are 200ft. each and the two spans 140ft. each; but despite this great length the pier has, during the last twenty-one years, stood many a fierce gale of wind and sea without the slightest damage.

Electrical Enterprise: Last Week's Deputation to the Board of Trade.—Mr. Gerald Balfour, President of the Board of Trade, last week received a deputation from the Institution of Electrical Engineers on the subject of the effects of legislation on electrical enterprise. The deputation was introduced by Lord Kelvin. Replying to the remarks made by members of the deputation, Mr. Balfour said he doubted whether the backwardness of electrical industry in this country as compared with America and Germany was due altogether to defects in legislation, or to regulations of an oppressive character, or to the abuse of power by local authorities. It appeared to him that the chief question was really the power which the Legislature had given to the local authorities to veto both Provisional Orders and Bills, but to some extent the evils flowing from that condition of things had been remedied by the adoption in many cases of Light Railways procedure, even when the scheme was really for a tramway. The subject of traction had been investigated by a Departmental Committee appointed by the Board of Trade, and as a result of the deliberations of that committee a Bill had been drafted which he thought would go very far to meet all the reasonable objections that had been urged against the present powers of the local authorities. With regard to electric supply the case was somewhat different. Where an enterprise for such a purpose was promoted by Bill, he believed that Parliamentary Committees now usually acted on the recommendation of the Committee of 1898, but legislation would be required in order to enable the Board of Trade to act on the recommendations of that Committee in respect of Provisional Orders, and a Bill was also ready to give effect to the recommendations of that Committee. He could not hold out much hope that either Bill would be passed during the present session; but it was the desire of the Board to press forward both measures.

The Merthyr Plasterers' dispute has been settled. The employers have agreed to extend the three months' notice of proposed reduction in wages until the 1st of May, 1903. The men came out on strike on June 1st as a protest against the employers' three months' notice.

HOLY CROSS CHURCH, ARDOYNE, BELFAST.

THE new Church of the Holy Cross at Ardoyne, Belfast, an illustration of which is given in our centre plates this week, was dedicated on Whit-Sunday last. The architects were the late Mr. Walter G. Doolin, M.A., and Mr. R. M. Butler, of Dublin. The church was begun in April, 1900, the first sod having been cut on March 11th and the foundation stone laid on June 17th. The west front faces towards Belfast, and from the principal entrance an extensive view of the city can be obtained. The architectural style is a free Romanesque treatment based on the model of the Lombardic churches in northern Italy. As the founder of the Passionist Order was a native of the district in which the ancient Irish foundations of St. Gall and Bobbio are situated, it may be said that there was a peculiar appropriateness in this. The building follows

avoid the archaic character of what is usually known as Romanesque. The detail of the great churches of Northern Italy naturally suggested itself, and perhaps still more the fine Romanesque churches of Southern France. This chapel (illustrated on this page) is of sufficient size to accommodate a congregation attending one of the minor weekday services. It is divided from the south aisle by an arcade of coupled Siberian marble columns. The entrance to the church through the great west doors gives access to the narthex under the organ gallery. The latter is of timber, decorated and supported on polished marble columns, having marble bases and carved stone capitals. Entering the nave from beneath this gallery, the first thing which attracts the attention is the fine perspective of marble columns, with elaborately carved capitals, and the air of spacious length conveyed, the view extending on the right into the Lady Chapel and on the left along the vista of the

the "Taking down from the Cross." Flanking the entrance on either side are the towers, the whole standing well up above the street on a terraced height. The fortunate circumstance of the grassy slopes and well planted terraces, with the background of rising hills, adds in no small degree to the general effect. The whole of the general contractor's work was carried out by Messrs. James Henry & Sons, Belfast.

Law Cases.

Two Paving Contractors: A Libel Action.—The case of *The Acme Wood Flooring Co., Ltd. v. Alcott* was heard last Thursday in the King's Bench Division of the High Court of Justice. It appeared that the plaintiffs and defendant were importers of American red-gum wood blocks and contractors for laying wood paving. Plaintiffs supplied a large number of blocks for the



THE LADY CHAPEL, HOLY CROSS CHURCH, ARDOYNE, BELFAST. R. M. BUTLER, ARCHITECT.

tradition as far as is consistent with modern requirements and the claims of individual character and originality. The character of the architectural ornament and detail is free, noticeable features being the strongly-marked cornices and string-courses and the enriched and boldly-recessed doorways. The plan of the church differs largely from the conventional Gothic of many modern Irish churches, conforming more to the plan of the Italian basilicas. It consists of nave and aisles, with large ritual chancel and side chapels, towers, baptistery and Calvary chapel. In addition, a very large important adjunct in the shape of a Lady Chapel, although not included in the original design, has been added through the generosity of Mr. John Taggart. Mr. R. M. Butler was the architect. In the design an effort was made to break away from the cast-iron "Gothic" of so much of the modern church building era, and yet to

north aisle, the eye at length resting on the central point of interest—the chancel. This is not yet furnished with the great high altar. The carving throughout the church is excellent. Every capital is different. The carving at the external capitals has in several instances marked Celtic characteristics. The figure carving is the work of Mr. James Ovens, of Dublin and Preston, the carving of the nave and other capitals having been executed by Mr. Thompson and Mr. Copeland, both of Belfast. The altars, mosaic pavements, &c., are all completed. The elaborate ceramic mosaic of the chancel and chapel is by Messrs. Craven, Dunnill & Co., of Jackfield, and the marble mosaic by Mr. J. F. Ebner, of London. Of the exterior the most imposing feature is, of course, the west front, with its heavily-moulded cornices and great west doors, the tympanum of which is filled with a sculptured group by Mr. Ovens representing

paving of certain streets in Brighton. In October last they and the defendant tendered in competition for the supply of blocks for the paving of certain streets in Bethnal Green, and the plaintiffs alleged that the defendant wrote to the town clerk of the borough as follows: "I have no doubt that the Acme Co. know all about gum wood and first thought of introducing it. In any case, I send you a photograph showing the gum wood recently laid at Brighton by that company, where a 3in. channel course was taken out after the wood had been down only for one week and the flags all broken." Plaintiff said that the letter imputed that they had supplied wood blocks which were improper and unfit for street-paving, and that they were not to be relied on. The accident at Brighton, they said, was due to circumstances over which they had no control. There was a delay in supplying the pitch to "grout up" the wood blocks after they had been

laid, and in consequence when rain fell the blocks absorbed it and expanded.—The defendant admitted that he wrote the letter, but denied that he was actuated by malice. He said the letter merely asserted that his wood was superior to that of the plaintiffs.—Mr. Justice Wills, in summing up, explained to the jury that if they thought the letter merely reflected on the quality of the wood supplied by the plaintiffs it was not actionable. If, however, they were of opinion that the letter suggested that the plaintiffs did not understand their business and did their work badly, it was a libel. The jury found a verdict for the plaintiffs, and assessed the damages at £200. Judgment with costs.

The Fall of a Hoarding: Claim against Builders.—The case of *M'Corry v. M'Laughlin* was heard in Dublin last week. It was an action brought by Charles M'Corry against Messrs. M'Laughlin & Harvey, builders, to recover £1,000 damages for personal injuries alleged to have been sustained by reason of the negligence of the defendants. Counsel for the plaintiff said that his client sustained the injuries owing to the falling of a hoarding at a house at George's Street, Kingstown, where the defendants were engaged in making alterations. Some men were taking down the hoarding, and this fell on the plaintiff as he was passing, permanently injuring his leg.—The jury awarded the plaintiff £150 damages and £50 for medical fees, with costs.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Velocity of Flow in Circular Sewers.

CAMBERLEY.—L. H. writes: "(1) The velocity in circular sewers is the same when running full and half-full. Does it follow that the discharge is also identical? Please furnish an example. (2) Kindly prove how the radius of the upper circle of an egg-shaped sewer $\times 4.5941$ (*vide* Molesworth, p. 306) should give the area of the sewer. (3) Would one-third or two-thirds of this give the sectional area of the fluid when the sewer is running one-third or two-thirds full? If not, how is the sectional area obtained? Also, how is the wetted perimeter determined?"

(1) The mean velocity of flow in circular sewers is the same when flowing full as when flowing half-full, but the discharge in the former case is exactly double that obtained in the latter. It is a matter of common observation that the velocity of liquids flowing through pipes or channels varies at different points of the same cross-section of the stream, owing to friction at the sides of the pipe; the velocity being least at the points of contact with the sides and greatest at the centre of the flow. The greater the sectional area of the stream as compared with its "wetted perimeter" the greater therefore the mean velocity of the flow. In other words, the mean velocity of flow in a circular sewer or pipe varies directly as the square root of the hydraulic mean depth (or H.M.D.) of the stream. The H.M.D. of a stream

$$\frac{\text{sectional area of flow}}{\text{wetted perimeter of flow}};$$

and it will be readily seen that the H.M.D. of a stream in a circular sewer flowing full is the same as when flowing half-full, for the area of a circle divided by its circumference gives exactly the same result as dividing half the area of a circle by half the circumference of the same circle. Taking the case of a 6in. drain flowing full and half-full, the H.M.D. in both instances is one-fourth the diameter (or .125ft.), and the mean velocity of the flow is also the same in both instances. The sectional area when flowing full is .196ft. super.; and .098ft. super. when flowing half-full. As the discharge is found by multiplying the sectional area of the flow by the velocity, it follows that the discharge from a drain flowing full is exactly double the discharge when flowing half-full. It may be interesting

to mention that the H.M.D. for liquids flowing through circular pipes or sewers is greatest when the depth of flow is approximately five-sixths the diameter of the pipe, and it is at this point that the maximum mean velocity is obtained. The maximum discharge is obtained when the depth of the flow is about eleven-twelfths the diameter of the pipe, and not when flowing full, as might ordinarily be supposed. (2) The formula is incorrectly quoted—it is as follows: area of sewer = $4.5941R^2$. This formula applies only to the particular standard section of egg-shaped sewer shown in the sketch accompanying it, and in which the radius of the upper circle is equal to one-half the transverse diameter, one-third the conjugate diameter, one-third the radius of the curved sides and twice the radius of the invert or lower circle. The above-mentioned formula is based on similar principles to that of the better-known formula relating to circles, in which it is stated that "area of circle = $3.1416R^2$." Proofs of such general statements should be verified by reference to an advanced mathematical work, as they do not fall within the scope of these columns. (3) A superficial examination of this sewer section will show that one-third or two-thirds the total sectional area cannot give the sectional area of the fluid when the sewer is flowing one-third or two-thirds full, if by the latter expression is meant one-third or two-thirds the total height of the sewer. The respective sectional areas and wetted perimeters for varying depths of flow in egg-shaped sewers of various sections can only be ascertained by a series of exhaustive calculations. For an egg-shaped sewer of the section already mentioned, the sectional area of the sewage flow when the depth of flow on the invert of the sewer is two-thirds the total height of the sewer = $3.0233R^2$, whilst the wetted perimeter for the same depth of flow = $4.7798R$. T. E. C.

The Oxford Colleges.

NEWCASTLE-ON-TYNE.—A NORTHERN ARCHITECTURAL STUDENT writes: "To whom should I apply to for permission to look over the Oxford colleges and chapels?"

There is little difficulty in getting over the college chapels, which are open to the public at certain hours. Particulars can be best obtained locally. If permission to sketch be desired, however, it should be sought by letter addressed to the principal of the particular college in question, a stamped and addressed envelope being enclosed for reply. G. A. T. M.

Fixing Pictures in Panelling over Fireplaces.

WARWICK.—ENQUIRER writes: "Is there any special material supplied for fixing at the back of oil paintings which are let into panelling over a fireplace? The heat from the flue at the back would probably affect the picture if the canvas were only fixed to woodwork. Which is the best way to fix pictures on mantels?"

It would probably suffice if the back of the canvas and the woodwork of stretcher received, first, a coat of good oil colour, and then one or more coats of waterproof paint. A sheet of thin galvanised iron or sheet zinc might then be fastened by screws at the back, the space between it and the canvas being filled with silicate cotton or asbestos fibre. Whilst I know of no special preparation which is generally used in such cases, the plan outlined above should suffice to protect the painting both from damp and heat. Assuming the word "mantels" in the latter portion of the query to mean chimney breast, it is possible that brass screws passing through glass plates into wood fixing blocks or plugs will be as suitable a method as any. H. E.

Churches around Kingston-on-Thames.

KINGSTON-ON-THAMES.—STUDENT writes: "Please name two or three churches in or near Kingston suitable to measure for the R.I.B.A. Intermediate Examination."

Kingston Church, though much altered from century to century, contains a certain amount of the original Decorated and Perpendicular work, as does also the Chapel of St. Mary Magdalene. A selection of suitable subjects for measurement could be made upon personal inspection of these churches. G. A. T. M.

R. I. B. A.

Presentation of the Royal Gold Medal.

THE last general meeting of the Royal Institute of British Architects was held on Monday evening, the chair being occupied by Mr. William Emerson (president).

The minutes of the previous meeting having been confirmed, Mr. Emerson announced that the Council of the Institute had sent a loyal address to his Majesty the King.

In presenting the Royal Gold Medal to Mr. Thomas E. Colcutt, he said that the medal was the greatest honour the Institute had in its power to recommend for bestowal on those who had distinguished themselves by their work or in furthering the art of architecture. Last year the medal had not been awarded, owing to the death of the late Queen, but since then his Majesty the King had graciously signified his intention to continue its presentation. In the architecture of the moment there was much to make us hopeful; and that the medal should be presented to Mr. Colcutt was an indication that the feeling in regard to architecture just now was distinctly against a slavish reproduction in our modern work of old examples, and also equally against the foolish ignoring of all precedent as a means of arriving at original productions. The following was a list of some of Mr. Colcutt's most important productions and the order in which they were carried out, commencing in 1872 with the Blackburn Free Library, and in following years the Wakefield Town Hall, the Imperial Institute, the P. & O. offices in Leadenhall Street, the City Bank, Ludgate Hill, the Beckstein Museum and Hall, Lloyds Registry of Shipping, besides the decoration of many of the saloons of the P. & O. steamers, and a number of country-houses and business premises.

Mr. Colcutt in acknowledging said in his opinion the Institute had done very much for the promotion and encouragement of their art, and the work of its students was laying the foundation of a wide knowledge that would enable them to deal with their real work in a scholarly, catholic and artistic manner, and also to meet the demands of modern requirements. The Institute had also encouraged the study of the art of building. No student could be fully equipped for his future work in life unless he was a builder as well as a designer of architecture.

Mr. Emerson then said that after many years of intimate relationship with the active work of that great Institute he had that evening in a way to say good-bye to them and to his valued friends and colleagues on the Council; for after leaving the chair, its presidents ceased from active work in connection with its affairs. His one and only aim and the feeling that had prompted all his efforts in acting in the capacity of president had been to add to the interests or influence of the Institute. He had always felt that the Royal Institute of British Architects should be the real and only representative body of architecture for the whole of the British Empire—and that it would fast become if they were only true to themselves, strong and not wanting in *esprit de corps*, and if they let one voice be heard on all important matters relating to their art and their profession with no wavering or uncertain mind. Before many years had passed the Institute should hold quite the influential position it ought to do, and there should be scarcely any men worth calling members of the profession who could care to stand aloof. As it was, he thought it must be somewhat of a selfish feeling which caused men of standing in the profession to refrain from assisting their brethren by not adding their influence or power to the representative body of that profession, and declining to join it or assist in upholding the common interests and strengthening the position of those following their own calling.

A vote of thanks to Mr. Emerson for his services, proposed by Mr. F. C. Penrose and seconded by Mr. Ernest George, was then carried by acclamation.

A New Board School at Clapton has been erected in Mandeville Street, Millfields Road. The new school accommodates 300 boys, 300 girls and 302 infants. It has cost over £23,000.

BIRMINGHAM'S NEW PUBLIC BATHS.

THE new swimming and private baths forming the extension to the Birmingham Corporation baths in Woodcock Street were opened recently. The extensions comprise one new swimming bath, with a water area 81ft. in length and 30ft. in width. The depth of the water at the shallow end is about 4ft. and at the deep end about 6ft. 4in. A promenade 6ft. 6in. wide has been provided on each side of the bath, and there are forty-eight private dressing-rooms communicating with it. A special needle and shower bath has also been constructed. The walls and floor of the bath have been cased with white-glazed bricks, terminating at the floor level with a covering of Forest of Dean stone. The walls of the bath hall and the dressing-rooms have been specially treated with a dado of cream-tinted glazed bricks, a moulded border dividing these from the upper filling of the ivory-white glazed bricks. Terra-cotta string-courses, mouldings, and arches, forming the doorway openings to the dressing-rooms, have been introduced. The roof is supported on ornamental cast-iron ribs of special design, and the hall is lighted by a lantern roof in addition to a large window in each gable end of the building. The frames of the gable windows are of terra-cotta, filled in with coloured lead lights, and the windows of the lantern roof are filled with Muranese glass. The private bath departments consist of eighteen separate bathrooms, divided into three sections, and each bathroom is fitted up with a white enamelled fireclay bath, enclosed with Sicilian polished marble tops and risers. The division walls of the bathrooms are of glazed bricks, with coloured bands and terra-cotta string-courses and moulded cornice of red bricks, as in the case of the large swimming bath. The floors are laid with mosaic terrazzo paving, with ornamental borders, excepting in the case of the promenade round the swimming bath, where a special border of ribbed adamantine tiles is laid next the kerb so that bathers may get a good foothold and not be likely to slip down. A small room has been provided for the occasional use of swimming-club members or as a waiting-room. The old corridor, formerly used as an entrance to the second-class swimming bath, has been converted into a first-class entrance passage leading to the new building. The old walls have been cased with glazed tiles to dado height, with a coloured border between them and the upper portion, which has been cased with opal wall-tiling by the British Opal Co. Arrangements have been made for warming the several departments in winter by means of steam pipes and radiators, and to prevent draughts half-glass doors have been provided at the entrance to each department, forming a vestibule between the inside and the outside corridors. Electric bells have been provided to each bathroom for communication with the bath attendants, whose rooms is placed between the two departments, thus giving a complete oversight of all persons entering or leaving the establishment. The estimated cost of the buildings was £11,000, which included £800 for sinking a new bore-hole from the bottom of the existing well for the purpose of obtaining an additional supply of water. The cost of the various engineering works, including the erection of a new and more powerful steam boiler, with special steam heaters, hot-water reserve tanks, and the various hot- and cold-water service pipes, also a special steam-heating apparatus for the swimming bath, drying closets and warming apparatus throughout, amounted to £950. The buildings have been erected by Messrs. John Bowen & Sons from designs by Mr. F. W. Lloyd, the architect appointed by the Baths and Parks Committee to carry out the work in accordance with the preliminary or administrative plans prepared by Mr. Job Cox, the committee's engineer, under whose supervision the various engineering works have been executed by the engineering staff of the department. The terrazzo paving has been executed by Messrs. Diespeker & Co., of London; the electric bell work by Richardson & Elliman, of Selly Park; the marble work by Messrs. Fraley & Son; and the stained-glass windows by O. C. Hawkes, Ltd. Messrs. Rufford & Co., of Stourbridge, have supplied the enamelled baths and

Messrs. Hart, Son & Peard the gas pendants and fittings.

THE REBUILDING OF GLASGOW.

CONSIDERABLE rebuilding is going on in Glasgow. Large new buildings, some of them rising to the height limit under the recent Building Regulations Act of 100ft., may be seen growing from day to day. Almost without exception they are built of red stone, and are equipped with elevators and other conveniences of the age. In addition, the enormous growth of tenement houses in the outlying districts, notably in Langside, Hyndland and Springburn, continues rapidly.

At the corner of Hope Street and West George Street a three-storey and attic block is being pulled down, and in its place will rise a large seven-storey block of shops and offices. At the east corner of Cambridge Street and Sauchiehall Street an old four-storey block of shops and dwelling-houses has been completely demolished within the last few weeks, and will be replaced by warehouse buildings in keeping with those already erected in the vicinity. About half a dozen very old shops in Cowcaddens are also in course of demolition for the extension of Sawers' ice stores and cold-storage premises. Operations will soon be begun for the taking down of the old buildings on the sites to be occupied by the new music-hall at the corner of Renfield Street and Renfrew Street. For the new theatre in Bath Street the ground is being cleared of its temporary buildings. At the corner of St. Vincent Street and Hope Street a six-storey and attic building of red stone is being erected for the Royal Bank on the site of the old branch bank, a three-storey building. The new building is to consist of a branch bank on the ground floor and offices on the upper floors. At the south corner of Buchanan Street and St. Vincent Place the only remaining buildings of those originally erected in Buchanan Street more than a century ago, partly of three storeys and partly of two, are fast disappearing to make room for a new building of eight storeys, 100ft. high, with a frontage of 150ft. down to Exchange Lane. It will consist of shops on the street floor and offices above. Another old Buchanan Street building, that of two storeys through which the entrance to the Arcade is formed, is about to be demolished.

A very large building, which will make an important alteration in the appearance of Union Street, has been begun for the Caledonian Railway Co. It will be seven storeys high, and is intended solely for the Caledonian Railway offices, with a parcel department downstairs. There will be a spacious entrance by a stairway to the Central Station, and also a cart entrance, in connection with a hoist, near the south end. A large addition to the Central Hotel is also in progress in Hope Street, besides the extension of the railway platforms. An entrance to the station is to be formed from Hope Street for cabs, &c., about the centre of the platform. In Gordon Street the Grosvenor Restaurant is being practically rebuilt. Although the outer walls remain as they were before the fire, the interior is to be entirely new, and two storeys are to be added by being carried on iron standards from the inside of the existing walls, the old walls remaining at the present elevation to Gordon Street. The shop floor will be used as at present, but the first and second floors are to be thrown into one for a spacious dining hall, approached from the centre by a grand staircase with a light dome above. The Corporation intend erecting another block of buildings in Woodlands Road, immediately to the west of the red stone tenement just completed. The frontage from Stanley Street will be thrown back so as to line with the broadened portion to the east. The new buildings will, like the others, be four storeys high. The Corporation Improvement Department are beginning the demolition of extensive properties on the east side of High Street, opposite the new tenements already erected on the other side, and similar operations are in progress on the east side of Market Street, leading from "the Briggate," and at the corner of Salemarket and Greendyke Street, where half a century ago a popular "penny gergie" stood.

New Patents.

These patents are open to opposition until July 28th.

1901.—Glass Stone.—12,589. L. A. GACHEY, 72, Boulevard Haussmann, Paris. New glass is poured into a thick metal mould, and after it has become pasty the mould is turned upside down on to a mould of sand which travels around in a devitrifying kiln. The glass is afterwards removed and pressed into shape.

Heating Apparatus.—13,152. I. S. McDOUGALL, 68, Port Street, Manchester; and J. LANGFIELD, 2, Egerton Park, Worsley. In the basement a water-heater is fixed. It is connected with an air-heating chamber containing coils of pipe. After the air has thus been warmed it is moistened by troughs containing water and supporting saturated fibrous material. A heating chamber may be placed in each room, if desired.

Concrete Slabs, Artificial Stone, &c.—13,835. G. P. WALLIS, Mount Road, Horsforth, Leeds. The object of this invention is to simplify the working parts of presses for concrete slabs, &c. Two or more moulds are used in conjunction with a single press, worked by a single rope, so that when one mould is under the press-head the other is being emptied and refilled. The moulds are formed with three of their sides loose and have bottom plates and lifting handles.

Brick Presses.—20,235. A. E. BLIZZARD, Poolfield, Keele Road, Newcastle-under-Lyme, and HENRY DODD, Brick Works, Etruria; both of G. Woolliscroft & Son, Ltd., Hanley. The object of this invention is to press the bricks slowly from both top and bottom dies. In order that this shall not affect the output, the motion of the dies is divided into various speeds—first a quick downward motion of both dies carrying the brick into the mould, then a slow motion of both dies coming together, and then a quick upward motion to their first position.

The following specifications were published on Thursday last, and are open to opposition until August 4th. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

1901.—10,838, BOULT (*Vial*), treatment of sewage, including the discharge from factories. 12,283, REYNOLDS & BRAUER, frames for horizontal saws. 12,383, SUTCLIFFE, machinery for making bricks, &c. 12,488, RANDALL & VALENTINE, wood screws. 12,869, LEE & GROVES, safety suspending apparatus for hoists, &c. 12,882, WAGGETT & WAGGETT, scaffolding. 13,011, GREENWOOD, automatic door checks. 13,684, NUTTER, cans for paint, &c. 13,832, ADAMS & CREER, sewage or water filters. 14,121, CHENEY, metal stop-hinges. 14,427, STEWART, sanitary pipe connections. 15,029, ASHTON, CROMPTON & KELLY, manufacture of Portland or hydraulic cement. 21,498, BECKETT, means for retaining doors in an open position. 25,551, ANDERSON, trap for baths, &c. 25,589, ZSCHIEDRICH, covering for floors, walls, &c.

1902.—3,518, JURSCHINA, artificial acid-proof stone. 4,725, LOBNITZ, apparatus for breaking up or cutting rocks, stones, earth, &c. 7,504, GIRLOT & SOCIÉTÉ GÉNÉRALE DU LAMINAGE ANNULAIRE POUR LA FABRICATION DE CHAINES SANS SOUDURE, chains. 8,208, WILSON, circular saws. 8,370, DE MAN, fire-proof flooring. 9,303, LAKE (*Warren*), cement compositions for roads, pavements, &c. 9,335, LAKE (*Warren*), pavements, roads, &c.

A New Church at Church Gresley is being erected from plans by Mr. J. T. Micklethwaite, architect, of London. The contractors are Messrs. Thomas Lowe & Sons, of Burton-on-Trent. So far as possible local material is being used. The building will be in the Gothic style, the exterior being of red bricks with stone facings. The construction has been so arranged that whilst the church will be complete as now proposed, and will provide seating accommodation for between 400 and 500 people, it will be capable of extension to provide accommodation for a further 300 when the necessity for this arises.

Keystones.

The View from Richmond Hill.—The Middlesex County Council have given £2,000 to make up the purchase price of the Marble Hill estate.

The Competition for a Wesleyan Church at West-houghton, Bolton, has been decided in favour of Messrs. Halsall, Tonge & Campbell, of Southport.

The King's Sanatorium—The advisory committee appointed in connection with the proposed King's Sanatorium for Consumption have purchased a site at Midhurst, Sussex.

A Small Map of Central London showing the Coronation Procession Route has been issued by Messrs. Fleming, Birkby & Goodall, Ltd., Halifax, and 39, Lime Street, London, E.C., makers of "Teon" belting.

A New Congregational Church at Wigan is being erected in Standish Gate at a cost of £6,000. The architect is Mr. F. W. Dixon, of Oldham and Manchester, whose design was selected in competition. Messrs. Joseph Wilson & Co., of Wigan, are the builders.

New Stables, &c., at Batley are being erected in Wilton Street for the Batley Co-operative Society. The contracts are being carried out by Messrs. E. Pickles, masons; Joseph Brook, joiner, Batley Carr; Sam Crawshaw, plasterer and concreter; James Walshaw, plumber; James Green, Son & Co., Leeds, stable fitters.

The Cistercian Abbey of Basingwerk, near Holywell, which is believed to have been built in the early part of the twelfth century, is in a ruinous state. It was recommended to the county council by Messrs. Davies & Sons, architects, of Chester, that the grounds be closed and a sum expended yearly in reparation till the whole building was rendered safe, but the council has decided to take no action, and the destructive processes are so quickly going on that the once fine abbey will soon be nothing better than a heap of shapeless ruins.

A New Ladies' Club, to be called the Ladies Army and Navy Club, has been established for the use of the wives and relatives of naval and military men at 17 and 18, Dover Street, Piccadilly. The premises have been to a large extent re-furnished and re-decorated by Messrs. Oetzmann & Co., the well-known firm in Hampstead Road. In the dining-room the carpet is of navy blue with a red, white and blue border, the chairs being in scarlet and dark oak. There are thirty bedrooms and plenty of sitting-rooms.

Irish Architects.—At a recent special meeting of the council of the Society of Architects the resolution passed at a meeting of the council of the Royal Institute of Architects of Ireland on June 2nd was considered. It was unanimously resolved that "the sympathy of this council be tendered to the Royal Institute of the Architects of Ireland in the attitude they have taken on the subject of the proposed selection of an architect by His Majesty's Treasury for the erection of the College of Science in Dublin, and it is the opinion of this council that for an Irish work of this national character an Irish architect should be solely employed." It was further resolved that a copy of this resolution be forwarded to the First Lord of the Treasury.

The Dundee Institute of Architecture held its annual general meeting last week in the new rooms, 104, Nethergate. The retiring president, Mr. J. P. Bruce, presided. The annual reports were read and approved, and the following office-bearers elected for the ensuing session:—President, A. A. Symon, Arbroath; vice-president, P. H. Thoms; members of council, G. A. Pyott, Charles Ower, F.S.A. Scot., Wm. Farquharson, W. G. Anderson; hon. secretary, David L. Allan, 41, Reform Street; hon. treasurer, Charles G. Soutar, 5, Whitehall Street; auditors, B. C. Douglas and J. D. Mills. The prizes in the Institute competition were awarded as follows:—Sketch-book, Stewart Kaye; measured drawings, John M. Fairweather; hon. mention, David Milne; water-colour drawing, Allan Robertson; design of Marine Hotel, David Milne; hon. mention, David Smith; design of farmhouse, Stewart Kaye; hon. mention, A. S. C. Nicholson; design of a boathouse, Arthur Wilson; hon. mention, A. S. Robertson; design for summer-house, William Simpson.

The late Mr. Hyman Davis, of Messrs. Davis Brothers, builders, 66, Bishopsgate Street, has left an estate of the value of £35,734 7s. 2d.

A Statue of Dr. Denny, LL.D., shipbuilder, has been erected at Dumbarton, in College Park grounds, before the main entrance to the new municipal buildings.

Sedgefield Hospital Competition has been decided in favour of Messrs. J. M. Bottomley, Son & Wellburn, architects, of Middlesbrough and Leeds.

A New Electric Lighting Station at Shoreditch has been erected in Whiston Street, on the banks of the Regent's Canal. Mr. C. Newton Russell, the borough engineer, carried out the work from plans by Mr. E. Manville, the consulting engineer.

In the Sutton Colliery Technical School Competition seven sets of designs were received, and the first premium of £25 has been awarded to Messrs. Crouch & Butler, of New Street, Birmingham, and the second of £15 to Mr. D. Arkell, of Temple Row West, Birmingham.

Ilkeston Public Library Competition, confined to local architects, has been decided by the assessor, Mr. Henry T. Hare, F.R.I.B.A., as follows:—1st, Messrs. Hunter & Woodhouse, of Belper; 2nd, Messrs. R. Sutton & Gregory, of Nottingham; 3rd, Messrs. H. H. Goodhall & Bradshaw, of Nottingham.

Burslem Hospital Competition.—The assessor in this competition, Mr. W. G. Laws, of Newcastle-on-Tyne, has awarded the first premium of £100 to Messrs. Sutcliffe & Sutcliffe, of Todmorden, and the second of £50 to Mr. E. C. H. Maidman, of Edinburgh. Mr. W. H. Walley, and Mr. R. T. Longden, both of Burslem, were placed third and fourth respectively.

The Next Building Trades Exhibition will be held at the Royal Agricultural Hall, Islington, from June 13th to June 20th, 1903. The main portion of the ground floor has already been allotted, so that immediate application should be made by intending exhibitors. It is intended to hold a colliery exhibition immediately following the building trades exhibition.

Excavations in the Forum.—Sgr. Boni, director of the excavations in the Forum, last week discovered two fresh tombs belonging to a prehistoric necropolis. The discovery places the existence of a necropolis beyond dispute, while the fact that one tomb contains ashes and the other a skeleton raises an interesting question as to the burial customs of the early inhabitants of Rome.

Mr. H. H. Armstead, R.A., was entertained at dinner last week by about forty of his fellow-sculptors. Mr. Armstead, who is by many years the senior of the sculptor members of the Royal Academy, has always taken a peculiar interest in the schools and the careers of the students, and few, if any, Academicians have served so frequently in the Modelling School; and it was to acknowledge his services to art that the past and present students of the Modelling School at the Royal Academy entertained him on Wednesday, the seventy-fourth anniversary of Mr. Armstead's birth. The chair was taken by Mr. George Frampton, R.A., who in the name of the company presented Mr. Armstead with a large modelling tool in ivory and silver.

The Annual Dinner of the Royal Institute of British Architects took place last Thursday at the Whitehall Rooms of the Hotel Métropole. The president (Mr. William Emerson) was in the chair. Mr. Aston Webb proposed "The Colonies," and in doing so asked how the union of the empire was going to affect the art of this country and of the world. He imagined that it was going to affect it very much indeed. He supposed that the great function of art had always been the expression of an idea of a nation and a country. For centuries art had expressed the aspiration of victory, sometimes—not so often—of peace, almost always of religion. Now, surely there was an opportunity for a new expression, a new aspiration which had come to us. Surely the art of the present day would be able to rise to that aspiration, and literature, painting, sculpture and architecture would be able in time to show some further development of their work which would be due to this new aspiration of ours of unity and empire.

A New Board School at West Hartlepool is being erected in Jesmond Road. It will be in three sections—namely, infants and junior and senior mixed schools—with a total accommodation for 1,418 children. The total cost is estimated at £21,900, the cost of the site being £1,240.

The York Queen Victoria Memorial Competition has been won by Mr. G. W. Milburn, of Bootham Bar, York. The statue will be placed in the Guildhall. A design for an entablature to form a background to the figure, submitted by Mr. Turner, headmaster of the York School of Art, has also been accepted. The work is estimated to cost £1,000.

The Edinburgh Architectural Association recently visited St. Monans, Balcaskie and Pittenweem. At St. Monans the fine old church was visited, and a historical account of it was given by the Rev. John Turnbull; Mr. P. Macgregor Chalmers, architect, afterwards describing the work he had recently carried out on the ancient building. The party then drove to Balcaskie, where, through the courtesy of Sir Ralph Anstruther, the house and gardens were visited, and greatly admired. The drive was continued to Pittenweem, and the old church, priory and lane were inspected.

A New Church at Seven Kings, Ilford, is being erected. It is in a free rendering of the Perpendicular style. The material are bricks and Bath stone. There will be seating accommodation for 802, but the portion now being built will provide for 480. The portion which will be completed first will consist of the chancel, side chapel, organ chamber and two bays of the nave and aisles. The cost of this will be £2,329, but the total cost of the church will be about £7,000. Mr. John Bentley is the builder, and the architects are Messrs. J. E. K. & J. P. Cutts.

Garden Cities.—Mr. George Cadbury has offered to subscribe £1,000 to the Garden City Pioneer Co. on condition that the whole capital of £20,000 is raised. That the scheme has some basis on practical experience and observation is shown in the confidence of men like Mr. Cadbury and Mr. Lever, who have become the principal supporters of the movement. In connection with the movement a great public conference is to be held at Liverpool and Port Sunlight on July 25th and 26th, when Messrs. Lever will entertain about a thousand delegates from all parts of the country. Special travelling arrangements are being made for the London delegates and members, and tickets should be applied for at once to the secretary, 77, Chancery Lane, W.C.

L.C.C. School of Arts and Crafts: Exhibition of Students' Work—The sixth annual exhibition of students' work at the L.C.C. Central School of Arts and Crafts will be open to the public free between 10 a.m. and 8 p.m. from July 1st to July 5th inclusive. The work comprises bookbinding, stained glass, silversmiths' work, enamelling, writing and illumination, carving and gilding, cabinet-work and wood-inlaying, architectural design, furniture design, drawing, modelling, &c. Seven hundred students have been in attendance during the session, the greater number being journeymen or apprentices engaged in artistic crafts. Saturday morning classes will be arranged next session for apprentices in the various branches of the silversmiths' trade.

A New Pavilion at Bournville has been presented by Messrs. Cadbury to their employees. It has been erected at a cost of £3,500. The front elevation is to Bournville Lane. It is half-timbered. The wood is solid black oak. The gymnasium has been fitted up by Mr. G. L. Plathauer, an erstwhile gymnastic champion of England, who has had a free hand in the selection of suitable apparatus. There is seating all round the gymnasium. From it one may step out upon an asphalted balcony, from which a view of the cricket and football ground can be obtained. On the second floor is a spacious refreshment room 53ft. by 20ft., flanked by two dressing-rooms. The luncheon-room is provided with a large bar, to which there is a separate entrance. Adjoining the dressing-rooms are two lavatories. The whole structure has been designed by Mr. Lewin, the firm's architect.

ARCHITECTURAL REGISTRATION IN AMERICA.

THE NEW JERSEY ARCHITECTS' LICENCE LAW.

THE following is the Act to regulate the practice of architecture approved on March 24th last by the Senate and General Assembly of the State of New Jersey, U.S.A. :—

1. *Board of Architects.*—Within sixty days after the passage of this Act the Governor of the State of New Jersey shall appoint five persons, at least four of whom shall be, at the time of this appointment, architects residing in the State of New Jersey, and who have been engaged in the practice of their profession for at least ten years. The said five persons shall constitute the New Jersey State Board of Architects, two of whom shall be appointed to hold office for one year and three of whom shall be appointed to hold office for two years.

2. *Succession of Board.*—Upon the expiration of the term of each member the Governor shall appoint his successor for a term of two years in like manner as the previous appointments. Each member shall hold over after the expiration of his term until his successor shall have been duly appointed and qualified.

3. *Vacancies; Compensation.*—Any vacancy occurring in the membership of the State Board of Architects shall be filled for the balance of the unexpired term in like manner. The members of the board shall serve without compensation for their services, except as hereinafter provided.

4. *Organization; Oath.*—The members of the New Jersey State Board of Architects shall, before entering upon the discharge of their duties, and within thirty days after their appointment, take and subscribe an oath before any officer authorized to administer oaths in the State for the faithful performance of duty, and file the same with the Secretary of State. They shall annually elect from their number a president and a secretary, who shall also be treasurer, each of whom shall hold office for one year and until their successors shall have been duly elected and qualified. The secretary and treasurer shall receive such compensation for his services as may be determined by the board.

5. *Rules, Records, &c.*—The board may adopt all necessary rules, regulations and by-laws to govern its proceedings not inconsistent with the laws of this State or of the United States. The board may adopt a seal, and the secretary shall have the care and custody thereof, and shall keep a record of all the proceedings of the board, which shall be open to public examination.

6. *Quorum.*—Three members of the board shall constitute a quorum.

7. *Special Meetings; Examinations.*—Special meetings of the board shall be called by the secretary upon the request of any two members by giving at least five days' written notice of the meeting to each member. The New Jersey State Board of Architects may adopt rules and regulations for the examination and registration of applicants desiring to practise architecture in accordance with the provisions of this Act, and may amend, modify and repeal such regulations from time to time.

8. *Public Notice of Changes.*—The board shall, immediately upon the election of each officer thereof, and upon the adoption, repeal or modification of the rules and regulations for the registration of applicants, file with the Secretary of State and publish in at least one daily newspaper in the State the name and post-office address of each officer, and a copy of such rules and regulations or the amendment, repeal or modification thereof.

9. *Semi-annual Examinations; Applicants.*—Provision shall be made by the State Board of Architects for holding examinations at least twice a year of applicants for registration to practise architecture, if there shall be any such applicants. Any person over twenty-one years of age, upon payment of a fee of 5 dols. (say £1) to the board, shall be entitled to enter any examination to determine the qualification for such registration.

10. *Who may be licensed.*—If the examination of any applicant for registration shall be satisfactory to the majority of the board, and upon the payment of an additional fee of 15 dols.

(say £3) to the said board, a certificate shall be issued to the applicant authorizing him to practise the profession of architecture. Any person who shall at the time of the passing of this Act be engaged in the practice of architecture in this State, and who shall present to the State board an affidavit to that effect or a certificate from a similarly constituted board of another State, and any person who is a member of the American Institute of Architects, shall be entitled to receive such certificate, upon the payment to the said board of a regular fee of 5 dols. (say £1). Each person licensed shall cause the license to be recorded in the Secretary of State's office.

11. *Revocation of Licence.*—Any certificate granted by the said board or obtained by affidavit, as above provided, may be revoked by the said board of architects for gross ignorance, recklessness, incompetency, dishonest practices, or other good and sufficient reasons; but before any certificate shall be revoked the holder shall be entitled to at least twenty days' notice of the charge against him, and of the time and place, within the county of his residence, of the meeting of the board, for the hearing and determination of such charge; for such purpose the board shall have the powers of a court of record, sitting in the county in which its meeting shall be held, to issue subpoenas, and to compel the attendance and testimony of witnesses; witnesses shall be entitled to the same fee as a witness is allowed in the circuit courts of this State, to be paid in like manner; the accused shall be entitled to the subpoena of the board for his witnesses, and a reasonable opportunity to produce his witnesses, and to be heard in person, or by counsel, in open public trial; the members of the board shall have power to administer oaths and conduct such examination of witnesses under oath; and no certificate shall be revoked, except upon the unanimous vote of all the members of the board; and any such revocation of certificates shall be certified in writing by the said State Board of Architects, under the hand of its president, or its president for the time being, and attested by the secretary, with the official seal of the said board affixed thereto, and such certificate shall be filed in the office of the Secretary of State, who shall be paid the usual fee for filing similar documents in his office.

12. *Certified Copy in Evidence.*—A copy of any certificate granted by the said board, or any revocation of the same, as by this Act provided, certified by the Secretary of State, where the original certificate or revocation thereof is required to be filed by the provisions of this Act, to be a true copy of the original filed in his office under the hand and seal of the said Secretary of State, shall be competent and plenary evidence to prove the facts contained in the said certificate, to the same extent as if the original document had been produced and proved in any court of civil or criminal jurisdiction whatsoever.

Refusal of Certificate reviewable by Court.—Any person whose certificate shall be refused or revoked by said State board shall have the right to appeal by *certiorari* to the supreme court for a review of such action, and the supreme court is hereby authorized and empowered to review and correct the action of said State board, and the State board shall forthwith carry out the judgment of the supreme court on such review.

13. *Penalty for practising without Licence.*—If any person shall pursue the practice of architecture in the State, or shall engage in this State in the business of preparing plans, specifications and preliminary data for the erection or alterations of buildings, or shall advertise or put out any sign, card or drawing designating himself as an architect, having an office and doing business within this State without a certificate thereof, in accordance with the provisions of this Act, he shall be guilty of a misdemeanour, and upon conviction shall be fined not less than 50 dols. (say £10) and not more than 500 dols. (£100) for each offence, or imprisonment in the county jail for a period of not less than one month.

14. *Exceptions.*—But nothing herein contained shall be construed to prohibit students or employees of licensed architects from acting upon the authority of such licensed architects, or to prohibit any person in this State from acting as designer of any building that is to be constructed by himself or his employees, or to

prevent any person from employing another person to prepare plans and specifications for the erection of any building with the full knowledge upon the part of said owner that said person is not a regularly registered architect according to the provisions of this Act.

15. *Expense of Board.*—The expense of said board, and of the officers thereof, and of the examinations held by said board, and of any other matter in connection with the provisions of this Act, shall be paid from the registration-fees above provided for, and not otherwise; and in no case shall any of such expense be paid by the State of New Jersey or be a charge against the said State.

16. *Annual Report.*—An itemized account of all receipts and expenditures of the said board shall be kept by its secretary, and a detailed report thereof, each year ending with the 30th day of September, duly verified by the affidavit of the said secretary, shall be filed with the Secretary of the State within sixty days thereafter; the said Secretary of State to be paid such fees therefor as are now paid for filing similar papers in his office.

17. *Expenses met.*—The members of the board shall be entitled to reimbursement for their travelling and hotel expenses, incurred in pursuance of their duties, not to exceed 5 dols. (say £1) per diem for each member of the said board. The secretary and treasurer of the State Board of Architects shall receive such annual compensation as shall be provided by the board, by resolution adopted by it at a regular meeting. No member of the board shall be held personally responsible for any portion of the secretary and treasurer's salary should the fees for certificates received by said board be insufficient to meet the same.

18. *Disposition of Surplus.*—Any surplus of fees remaining in the treasury after the payment of the expenses of the members of the board, and the salary of secretary and treasurer, as herein provided for, shall be paid annually to the treasurer of the State of New Jersey, and shall only be paid out upon the warrant and authority thereafter of the Comptroller of the State.

The State Board of Architects, as at present constituted, is as follows :—

Charles P. Baldwin, Newark (president).
Hugh Roberts, Jersey City (secretary and treasurer).
Arnold H. Moses (Camden).
Charles Edwards (Paterson).
David B. Provost (Elizabeth).

Rules of the Board.

Seven rules have been drawn up by the board. Some of them set forth what has already been given in the Act, but rule 6 states :—In all cases where an applicant for a certificate to practise architecture in the State of New Jersey shall cite to the board existing buildings erected from his or her design and under his or her supervision, and when the character of such work and the applicant's connection therewith are such as to satisfy the board of the applicant's ability to practise architecture, said demonstration shall take the place of written or oral examination. In carrying out this rule the board shall require the personal attendance of the applicant when said applicant is a resident of the State of New Jersey. Applications for certificates from residents of other States may be considered at any meeting of the board without the personal appearance of the applicant. If the proofs submitted in connection with said applications from resident and non-resident architects establish an ability equal to that demanded by the regular written and oral examinations, the board may issue its certificate to the applicant.

Regular written and oral examinations shall be held as provided by the Act of March 24th, 1902. The time shall be devoted to ascertaining the ability of the candidate to make practical application of his or her knowledge in the professional work of an architect. The examination shall be directed toward ascertaining the qualifications of the applicant in draughtsmanship, rendering, construction, design and the art of planning.

A diploma of graduation from the full course in architecture in any university or technical school approved by the board may be accepted as satisfactory evidence of a competent knowledge of architectural design and construction,

and shall entitle the recipient to a certificate to practise as an architect in the State of New Jersey, providing said applicant shall present evidence satisfactory to the board that he or she has acquired the ability to successfully apply his or her knowledge to the designing, construction and supervision of buildings, and shall have paid the fees of 5 dols. (say £1) for admission to examination and the additional fee of 15 dols. (say £3) for certificate, as prescribed by the Act.

Applications for examination will be received at any time, and should their number and urgency make it seem expedient to the board to hold examinations at any time other than heretofore mentioned, due notice of such additional examinations will be forwarded by the secretary to those whose applications are already filed at his office. Applications to enter a semi-annual examination should be at the secretary's office one week before the time set for said examination.

Each member of a firm of practising architects must have a separate certificate. All certificates shall be signed by the president and secretary.

7. The board shall adopt a seal for its own use and shall have the words "New Jersey State Board of Architects" inscribed thereon, and the secretary shall have the care and custody thereof.

Every registered architect *should* have a seal, the impression of which should contain the name of the architect, his place of business and the words "Registered Architect," with which all plans prepared by him should be stamped. Seals should be circular and 2 in. in diameter. The words "State of New Jersey" should appear at the top, the words "Registered Architect" at the bottom, the name and place of business in the centre. Where there is a co-partnership of architects the different names of the several members may appear on one seal. A seal should be used and not a rubber-stamp.

BUILDING NOTES AND MEMORANDA.—III.

By T. E. COLEMAN, F.S.I.

(Continued from p. 269, No. 383.)

Concrete.

1 cub. yd. of concrete (1 to 6) = 32 cub. ft. of ballast or gravel aggregate, 5 cub. ft. (4 bushels) of lias lime or cement, and 25 gals. of water = 27 cub. ft. of broken brick or stone, 9 cub. ft. of sand and 5 cub. ft. (4 bushels) of lias lime or cement.

Weight of Concrete.

Concrete with brick aggregate	Average weight per ft. cube.
" " stone	120
" " ballast	130
" " ballast	140

DRAIN LAYER.

Weight of Stoneware Drain-pipes, &c.

Diameter of pipe.	Thickness of stoneware, ins.	Weight per pipe (2ft. lengths), lbs.
4 in.	$\frac{1}{2}$	18
6 "	$\frac{3}{4}$	32
9 "	1	58
12 "	1	90

Bricklayer.

1 rod super. of reduced brickwork = 272ft. super. of walling $1\frac{1}{2}$ bricks (14in.) thick = 408ft. super. one-brick thick = 304yds. super. $1\frac{1}{2}$ bricks thick = 45yds. super. one-brick thick = 64 rods super. one-brick thick = 306 cub. ft. = 11 $\frac{1}{2}$ cub. yds. = 235 cub. ft. of brickwork and 71 cub. ft. (107 hods) of mortar = 5,370 bricks laid dry = 4,350 bricks, 1 cub. yd. of lime, 3 cub. yds. of sand and 150 gals. of water = 4,350 bricks, 38 bushels ($1\frac{1}{2}$ cub. yds.) of cement and $1\frac{1}{2}$ cub. yds. of sand = 15 tons in weight approximately.

1 yd. super. of brick facings and mortar for pointing = 64 bricks and $\frac{1}{2}$ cub. ft. of mortar in Flemish bond = 72 bricks and $\frac{1}{2}$ cub. ft. of mortar in English bond.

1 yd. super. of half-brick walling = 48 bricks and $\frac{3}{4}$ cub. ft. of mortar.

1 yd. super. of brick-nogging = 48 bricks and $\frac{3}{4}$ cub. ft. of mortar if laid flat = 32 bricks and $\frac{1}{2}$ cub. ft. of mortar if laid on edge.

1 yd. super. of brick flat paving in mortar = 32 common bricks and 1 cub. ft. of mortar = 70 Dutch clinkers and 2 cub. ft. of mortar.

1 yd. super. of brick on edge paving in mortar = 48 bricks and $1\frac{1}{4}$ cub. ft. of mortar = 140 Dutch clinkers and $2\frac{1}{2}$ cub. ft. of mortar.

1 yd. cub of mortar = 9 cub. ft. (7 bushels) of lime, 27 cub. ft. of sand (proportions 1 to 3) and 50 gals. of water = 12 cub. ft. (9 bushels) of lime or cement, 24 cub. ft. of sand (proportions 1 to 2) = 16 cub. ft. (13 bushels) of cement and 16 cub. ft. of sand (proportions 1 to 1).

1 load of mortar = 1 cub. yd. = 40 hods = 21 bushels = 27 cub. ft.

1 hod of mortar = $\frac{3}{8}$ cub. ft. = $\frac{1}{4}$ bushel nearly = 1,134 cub. in.

1 wheel-barrow = $\frac{1}{16}$ cub. yd. approximately.

1 load = 1 cub. yd. of mortar, sand, earth or rubbish = 1 measure or hundred of lime = 500 bricks = 1,000 tiles = 1 butt (108 gals.) of water approximately.

Cements, Limes, &c.

Portland cement is sold at per ton or per cental (trade bushel) of 100lbs. Roman cement at per ton or per trade bushel of 70lbs. Medina cement at per ton or per trade bushel of 68lbs. Blue lias lime at per ton or per trade yard or hundred. Chalk and grey stone limes at per trade yard, hundred or chaldron. Plaster of Paris, Parian cement and Keene's cement, at per ton or per cwt.

1 trade bushel of cement = 100lbs. of Portland cement = 70lbs. of Roman cement = 68lbs. of Medina cement = 75lbs. of Keene's cement = 66lbs. of Parian cement.

1 cental of Portland cement = 100lbs. = 1 trade bushel of Portland cement.

1 bag of cement = 2 centals of Portland cement = 3 trade bushels of Roman or Medina cement = 3 trade bushels of Keene's or Parian cement.

1 bag of lime = 2 bushels of grey stone lime = 3 bushels of blue lias lime.

1 bag of plaster-of-Paris = 2 cwts.

1 ton of blue lias lime = 11 bags.

1 cask of fireclay = 10 cwts.

1 cask of cement = 4 centals of Portland cement = 3 $\frac{1}{2}$ trade bushels of Roman or Medina cement = 3 $\frac{1}{2}$ trade bushels of Keene's or Parian cement.

1 bushel (dry measure) = 4 pecks = 8 gals.

1 imperial bushel = 1.2837 cub. ft. = .0475 cub. yds. = 2,218.2 cub. in.

1 Winchester bushel = 1.244 cub. ft. = .046 cub. yds. = 2,150.4 cub. in.

1 striked bushel = 1 imperial bushel.

1 cub. ft. = .779 imperial bushels = .804 Winchester bushels = .037 cub. yd. = 1,728 cub. in.

1 cub. yd. = 21.033 imperial bushels = 21.704 Winchester bushels = 27 cub. ft. = 46,656 cub. in.

1 trade bushel of lime = 1 heaped imperial bushel = 1.625 cub. ft.

1 basket of lime = $1\frac{1}{2}$ trade bushels of lime = 2.437 cub. ft.

1 chaldron of lime = 2 measures of lime = 36 heaped imperial bushels (trade bushels) = 24 baskets of lime = 2 hundreds of lime = 200 pecks = 2 yds. of lime = 58 $\frac{1}{2}$ cub. ft.

1 yd. of lime = 1 heaped cub. yd. = 3ft. by 3ft. by 3in. = 29 $\frac{1}{4}$ cub. ft. = 18 heaped imperial bushels = 12 baskets of lime = 100 pecks.

1 hundred of lime = 1 yd. of lime.

1 measure of lime = 1 yd. of lime.

2 doz. of whitening = 1 cwt. = 112lbs.

Weight of Cement, Limes, &c.

	Average weight per ft. cube.	Average weight per imperial bushel.
Portland cement	86	112
Roman "	62	80
Medina "	61	78
Keene's "	64	82
Parian "	60	77
Plaster-of-Paris	55	71
Blue lias lime (lump)	60	78
ditto (ground)	54	70

Size and Weight of Bricks.

Description.	Size.	Approximate Weight.	Approx. Weight per 1,000.
	inches.	lbs.	cwts.
London stocks	8 $\frac{1}{2}$ by 4 $\frac{1}{2}$ by 2 $\frac{1}{2}$	6 $\frac{1}{2}$	60
Ordinary kiln	8 $\frac{1}{2}$ by 4 $\frac{1}{2}$ by 2 $\frac{1}{2}$	7	63
Stourbridge fire-bricks	9 by 4 $\frac{1}{2}$ by 2 $\frac{1}{2}$	7 $\frac{1}{2}$	69
Welsh ditto	9 by 4 $\frac{1}{2}$ by 2 $\frac{1}{2}$	8	72
Staffordshire blue bricks	9 by 4 $\frac{1}{2}$ by 3	10	90
Ditto blue paviers	9 by 4 $\frac{1}{2}$ by 2	6 $\frac{1}{2}$	57
Dutch clinkers	6 $\frac{1}{2}$ by 3 by 1 $\frac{1}{2}$	1 $\frac{1}{2}$	14

Tiler.

1 plain tile = 10 $\frac{1}{2}$ in. by 6 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. in size, and weighs 2 $\frac{1}{2}$ lbs. average.

1 pantile = 13 $\frac{1}{2}$ in. by 9 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. in size, and weighs 5 lbs. average.

1 bundle of plain tile laths = 500ft. run = 100 laths 5ft. long = 125 laths 4ft. long.

1 load of plain tile laths = 30 bundles.

1 bundle of pantile laths = 120ft. run = 12 laths 10ft. long.

1 plain tile lath = a fir reended lath 1 $\frac{1}{2}$ in. wide, $\frac{1}{4}$ in. thick and 4ft. to 5ft. long.

1 pantile lath = a fir sawn lath 1 $\frac{1}{2}$ in. wide, 1 in. thick and 10ft. long.

1 slate or tile batten = a fir batten 2 $\frac{1}{2}$ in. by 1 in. or 2 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. in section for ordinary work.

1 square of plain tiling = 650 tiles, 1 peck of tile-pins, 290 nails, 340ft. run of laths and 2 $\frac{1}{2}$ cub. ft. of mortar for 3 $\frac{1}{2}$ in. gauge = 570 tiles, 1 peck of tile-pins, 260 nails, 300ft. run of laths and 2 cub. ft. of mortar for 4 in. gauge = 15 cwt. approximately.

1 square of pantiling = 180 tiles, 110 nails and 120ft. run of laths for 10 in. gauge = 164 tiles, 100 nails and 110ft. run of laths for 11 in. gauge = 8 cwt. approximately.

Mason.

1 ton of stone average = 16 cub. ft. of Bath stone = 15 cub. ft. of Portland = 14 $\frac{1}{2}$ cub. ft. of Craigleith = 14 $\frac{1}{2}$ cub. ft. of hard York = 14 cub. ft. of Purbeck = 13 $\frac{1}{2}$ cub. ft. of granite = 13 cub. ft. of marble = 70ft. super. of 2 $\frac{1}{2}$ in York paving = 58ft. super. of 3 in. York paving = 68ft. super. of 2 $\frac{1}{2}$ in. Purbeck paving = 56ft. super. of 3 in. Furbeck paving = 54ft. super. of 3 in. granite pitcher paving = 40ft. super. of 4 in. granite pitcher paving = 22 to 26 cub. ft. of ordinary stacked rubble stone.

1 cub. yd. of walling = 18ft. super. of walling 18 in. thick = 32 cub. ft. of rough stone and 9 cub. ft. of mortar for uncoursed rubble walling = 36 cub. ft. of rough stone and 7 cub. ft. of mortar for coursed rubble walling = 30 cub. ft. of rough flints and 9 cub. ft. of mortar for flint walling.

1 ton of flints = 32ft. super. of flint facing with whole flints = 50ft. super. of knapped flint facing.

Weight of Building Stones, &c.

	Average weight per ft. cube.
Limestones.	lbs.
Ancaster (Lincolnshire)	139
Bath (Somersetshire)	135
Beer (Devonshire)	140
Caen (Normandy)	125
Chilmark (Wiltshire)	138
Hopton Wood (Derbyshire)	156
Ketton (Rutlandshire)	128
Portland "best bed" (Dorsetshire)	135
Ditto "roach" (ditto)	150

Sandstones.

Corsehill "red" (Dumfriesshire)	154
Craigleith (Edinburgh)	146
Darley Dale (Derbyshire)	148
Mansfield "white" (Nottinghamshire)	149
Ditto "red" (ditto)	148
Bramley Fall (Yorkshire)	142
Scotgate Ash (ditto)	153

Granites, slate, marble, &c.

Granite (Aberdeen)	165
" (Cornish)	172
" (Devon)	166
" (Guernsey)	180
" (Irish)	170
Slate (Welsh)	180
Marbles (average)	170

Carpenter and Joiner.

Fir timber is chiefly used for ordinary building operations, and is imported in enormous

quantities from Norway, Sweden, Russia, North Germany and Canada. Fir baulks are generally divided into three qualities for commercial purposes—1sts or "best middling, 2ns is or "good middling," and 3rds or "common middling"; whilst planks, deals and battens are usually bracked or sorted into 1sts and 2nds or "mixed," 3rd quality, 4th quality, 5th quality and unsorted. The different qualities of deals, &c., vary considerably according to the particular brand or reputation of the shipper, as some firms exercise a greater care in sorting their timber. For instance, the 3rd quality deals of one shipper may be equal in quality to the "mixed" of another brand. Swedish deals are distinguished by having the shipper's brand or letters denoting the quality stencilled in red paint across each end. Norwegian deals have their brand stencilled in blue on the ends, whilst Canadian timber is stencilled in black and white. Russian timber is hammer-branded, having the letters or device deeply indented on the ends. The quality of Memel, Riga and Dantzie timber is distinguished by marks scribed with a chisel on the sides of the baulks. A list of the marks or brands denoting the various qualities of the timber as sorted by the shipper or timber merchant will be found in various works dealing with the subject in detail. A hundred of deals=120 deals of specified length and size. Deals are usually sold by the "standard hundred," or—as it is generally called—the "standard." The quantity of timber in a "standard" of deals varies according to the locality, as different districts have adopted a different unit of measurement. In London and Dublin the standard hundred consists of 120 deals 9in. by 3in. in section and 12ft. long. In Hull, Grimsby and other timber importing centres the "Petersburg" standard hundred is adopted, and consists of 120 deals 11in. by 3in. in section, and 6ft. long. The following list gives particulars of the principal standard hundreds used in the timber trade:—

London "standard" = 120 deals. 9in. by 3in. and 12ft. long = 270ft. cube = 1.64 Petersburg standards = 2.618 Christiania standards = 1.182 Quebec standards = 1.440ft. run 9in. by 3in. = 1,178 ft. run 11in. by 3in. = 2,160ft. super. of 1½in. deal.

Dublin "standard" = 1 London standard.

Petersburg "standard" = 120 deals 11in. by 3in. and 6ft. long = 120 deals 11in. by 1½in. and 12ft. long = 165ft. cube = .611 London standards = 1.6 Christiania standards = .72 Quebec standards = 880ft. run 9in. by 3in. = 720ft. run 11in. by 3in. = 1,320ft. super. of 1½in. deal.

Christiania "standard" = 120 deals 9in. by 1½in. and 11ft. long = 103½ft. cube = .382 London standards = .625 Petersburg standards = .375 Quebec standards = 550ft. run 9in. by 3in. = 450ft. run 11in. by 3in. = 825ft. super. of 1½in. deal.

Quebec "standard" = 120 deals 11in. by 3in. and 10ft. long = 275ft. cube = 1.0185 London standards = 1.667 Petersburg standards = 2.667 Christiania standards = 1.466½ft. run 9in. by 3in. = 1,200ft. run 11in. by 3in. = 2,200ft. super. of 1½in. deal.

1 load = 50 cub. ft. of squared timber = 40 cub. ft. of unhewn timber = 600ft. super. of 1in. boarding.

1 float = 18 loads = 900 cub. ft. of squared timber.

1 cord = 128 cub. ft. = 8ft. by 4ft. by 4ft.

Fir in log or baulk is sold at per load.

Boards are sold at per square of 100 super. ft., except at London timber sales, when they are sold at per square of 105 super. ft.

Lathwood is sold at per cub. fathom of 6ft. by 6ft. by 6ft. = 216ft. cube.

Oak wainscot logs are sold at per log of 18ft. cube, or at per ft. cube.

Planks are 11in. wide, deals 9in. wide, and battens 7in. wide.

1 ton of timber (average) = 64 cub. ft. of deals = 63 cub. ft. of Baltic fir = 57 cub. ft. of elm = 53 cub. ft. of walnut = 46 cub. ft. of ash = 44 cub. ft. of beech = 40 cub. ft. of oak = 38 cub. ft. of mahogany = 30 cub. ft. of ebony.

Weight of Timbers.

Description.	Average weight per cub. ft.
Ash	49
Beech	51

Weight of Timbers—cont.

Description.	Average weight per cub. ft.
Box	75
Cork (bark)	15
Ebony	72
Elm	40
Fir (Baltic)	35
Mahogany	56
Oak	53
Pine, American yellow	28
Pitch-pine	50
Teak	48
Walnut	42
Yew	50

Slater.

1 thousand of slates = 1,200 slates = 1,260 slates (actual count at quarry).

1 hundred of slates = 120 slates.

1 ton of Westmorland slates (random sizes) = 2½ squares of slating approximately.

1 ton of Welsh rag slates = 2 squares of slating approximately.

S and rd Sizes of Slates, &c.

Name.	Size.	Number required per square.	Average weight per thousand (1,200).
		½in. lap. 3in. lap.	
Doubles	12 by 8	380	400
Ladies	16 by 8	266	277
Viscountess	18 by 10	185	192
Countess	20 by 10	165	170
Marchioness	22 by 12	123	126
Duchess	24 by 12	112	115
			60

SMITH AND FOUNDER.

Gauges for sheet metals, wire, &c.

There are several different standards or gauges used in the metal trades for describing the thickness of sheet metals, iron, copper and brass wires, &c. The principal gauges used in this country are as follows:—

Standard wire gauge.—This is the recognised legal standard gauge, as authorised by the Board of Trade in March, 1884, and is generally indicated by the letters "S.W.G." (or "W.G."). Sometimes it is known as the "Imperial standard wire gauge" (I.S.W.G.). It is used for describing the thickness of sheet metals, also for iron, steel, copper, brass, and other wires, or similar metal-work.

Birmingham wire gauge.—This well-known gauge is indicated by the letters "B.W.G.," and is used amongst the Staffordshire wire and sheet plate manufacturers. It is also known as "Stubbs" gauge. Before the introduction of the Imperial standard wire gauge already mentioned, the Birmingham wire gauge was in general use throughout the metal trades, but it is now being gradually superseded by the standard wire gauge.

Birmingham sheet- and hoop-iron gauge.—This standard (which is sometimes called the "New Birmingham Wire Gauge") was adopted by the South Staffordshire Ironmasters' Association on March 1st, 1884, for local use in the metal trades. It is also known as the "Birmingham gauge," being denoted by the abbreviation "B.G. 1884," and is used for specifying the thickness of iron or steel sheets, hoop iron, &c. Like the "Birmingham wire gauge," it is being supplanted by the "Imperial standard wire gauge" for general purposes.

English zinc gauge.—This gauge is generally used for specifying the thickness of sheet zinc. For roofs, gutters, &c., sheet zinc should not be less than No. 15 or No. 16 gauge.

Vieille Montagne zinc gauge.—This gauge is used in connection with the zinc sheets manufactured by the Vieille Montagne Zinc Mining Co., which are largely sold in this country for roofing purposes.

Besides the gauges mentioned, there are numerous others, such as the "Whitworth decimal gauge," the "American standard gauge," the "Needle-wire gauge," &c., but as these are not usually met with in ordinary building work they are not given in detail here.

STANDARD WIRE GAUGE (S.W.G.).

No. of gauge.	Thickness or diameter.	Weight per ft. super. of sheet wrought-iron.	Weight per 100ft. run of wrought-iron wire.
	inches. millimetres.	lbs.	lbs.
7/0	.500 12.700	20.000	64.46
6/0	.464 11.785	18.241	55.50
5/0	.432 10.972	17.672	48.13
4/0	.400 10.159	16.416	41.30
3/0	.372 9.449	15.035	35.70
2/0	.348 8.839	14.065	31.22
0	.324 8.229	13.095	27.77
1	.300 7.620	12.125	23.80
2	.276 7.010	11.155	20.15
3	.252 6.401	10.185	16.80
4	.232 5.893	9.737	14.25
5	.212 5.385	8.468	11.88
6	.192 4.877	7.760	9.75
7	.176 4.470	7.113	8.19
8	.160 4.064	6.467	6.77
9	.144 3.658	5.820	5.49
10	.128 3.251	5.173	4.33
11	.116 2.946	4.688	3.60
12	.104 2.642	4.203	2.86
13	.092 2.337	3.718	2.24
14	.080 2.032	3.233	1.69
15	.072 1.829	2.910	1.37
16	.064 1.626	2.587	1.08
17	.056 1.422	2.263	.83
18	.048 1.219	1.940	.61
19	.040 1.016	1.617	.42
20	.036 .914	1.455	.34
21	.032 .813	1.293	.31
22	.028 .711	1.132	.24
23	.024 .610	.970	.18
24	.022 .559	.889	.15
25	.020 .508	.808	.12
26	.018 .457	.727	.10
27	.016 .416	.663	.08
28	.014 .375	.598	.07
29	.013 .345	.556	.06
30	.012 .315	.492	.05
31	.0116 .294	.469	.04
32	.0108 .274	.436	.03
33	.0100 .254	.404	—
34	.0092 .233	.372	—
35	.0084 .213	.339	—
36	.0076 .193	.306	—
37	.0068 .172	.275	—
38	.0060 .152	.242	—
39	.0052 .132	.210	—
40	.0048 .121	.194	—

Note.—For weight of steel, multiply the above by 1.02; brass, 1.09; copper, 1.15.

BIRMINGHAM WIRE GAUGE (B.W.G.).

No. of gauge.	Thickness or diameter.	Weight per ft. super. of sheet wrought-iron.
	inches. millimetres.	lbs.
5/0	.500 12.700	20.00
4/0	.454 11.531	18.19
3/0	.425 10.794	17.66
2/0	.380 9.651	15.16
1/0	.340 8.635	13.74
1	.300 7.620	12.13
2	.284 7.213	11.48
3	.259 6.573	10.55
4	.238 6.045	9.66
5	.220 5.537	8.77
6	.203 5.155	8.41
7	.180 4.571	7.56
8	.165 4.190	6.71
9	.148 3.759	6.39
10	.134 3.403	5.54
11	.120 3.048	5.05
12	.109 2.768	4.41
13	.095 2.413	3.80
14	.083 2.108	3.23
15	.072 1.829	2.91
16	.065 1.651	2.55
17	.058 1.473	2.22
18	.049 1.257	1.98
19	.042 1.066	1.76
20	.035 .889	1.42
21	.032 .813	1.30
22	.028 .711	1.13
23	.025 .635	1.09

BIRMINGHAM WIRE GAUGE (B.W.G.)—*cont.*

No. of gauge.	Thickness or diameter.		Weight per ft. super. of sheet wrought-iron.
	inches.	millimetres.	lbs.
24	·022	·559	·89
25	·020	·508	·81
26	·018	·457	·73
27	·016	·416	·66
28	·014	·375	·60
29	·013	·345	·56
30	·012	·315	·49
31	·010	·254	·40
32	·009	·220	·36
33	·008	·200	·32
34	·007	·173	·28
35	·005	·127	·21
36	·004	·101	·16

Note.—For weight of steel, multiply the above by 1·02; brass, 1·09; copper, 1·15.

BIRMINGHAM SHEET-IRON GAUGE
(B.G. 1884).

No. of gauge.	Thickness or diameter.		Weight per ft. super. of sheet wrought-iron.
	inches.	millimetres.	lbs.
3/0	·500	12·700	20·000
2/0	·445	11·308	17·808
1/0	·396	10·068	15·856
1	·353	8·971	14·128
2	·314	7·993	12·588
3	·280	7·122	11·216
4	·250	6·350	10·000
5	·222	5·651	8·900
6	·198	5·032	7·924
7	·176	4·470	7·113
8	·157	3·988	6·280
9	·139	3·551	5·592
10	·125	3·175	5·000
11	·111	2·827	4·452
12	·099	2·517	3·964
13	·088	2·240	3·528
14	·078	1·994	3·140
15	·069	1·775	2·796
16	·062	1·587	2·500
17	·055	1·412	2·224
18	·049	1·257	1·980
19	·044	1·118	1·760
20	·039	·996	1·568
21	·034	·886	1·396
22	·031	·794	1·250
23	·027	·707	1·112
24	·024	·610	·970
25	·022	·559	·889
26	·019	·498	·784
27	·017	·443	·698
28	·015	·396	·625
29	·013	·345	·556
30	·012	·315	·492

Note.—For weight of steel, multiply the above by 1·02; brass, 1·09; copper, 1·15.

ENGLISH ZINC GAUGE.

No. of gauge.	Thickness.	Approx. weight per ft. super. of sheet zinc.
	inches.	oz.
1	·004	2·00
2	·006	3·50
3	·007	4·56
4	·008	5·00
5	·010	6·00
6	·011	6·87
7	·013	7·75
8	·015	9·00
9	·017	10·25
10	·019	11·50
11	·021	13·31
12	·025	15·13
13	·028	16·75
14	·031	18·50
15	·036	21·75
16	·041	25·00

ENGLISH ZINC GAUGE—*cont.*

No. of gauge.	Thickness.	Approx. weight per ft. super. of sheet zinc.
	inches.	oz.
17	·046	29·00
18	·051	34·00
19	·059	36·75
20	·065	39·00
21	·072	40·75

VIEILLE MONTAGNE ZINC GAUGE.

No. of gauge.	Thickness.	Weight per ft. super. of sheet zinc.
	inches.	oz.
1	·001	1·15
2	·003	1·25
3	·005	3·45
4	·007	4·56
5	·009	5·69
6	·011	6·87
7	·012	8·00
8	·014	9·15
9	·016	10·31
10	·018	11·45
11	·021	13·31
12	·025	15·13
13	·029	16·94
14	·032	18·75
15	·036	21·75
16	·040	24·75
17	·043	27·69
18	·047	30·69
19	·050	33·70
20	·058	36·63
21	·072	40·75
22	·076	44·88
23	·080	49·06
24	·089	53·19

WEIGHT OF WROUGHT-IRON SCREW BOLTS AND NUTS.

Including square heads, nuts, and two washers. Length taken from end of bolt to underside of head.

Diameter of bolt.	Length of bolt.					Add or deduct for every inch difference in length.
	2 inches.	2½ inches.	3 inches.	6 inches.	12 inches.	
inches.	lbs.	oz.	lbs.	oz.	lbs.	oz.
1	2	2	2½	2½	3	4½
1½	4	4	4	4	6	9
2	7	7	8	10½	1	0
2½	13	13	14½	1	3	1
3	1	1	2	1	9	2
3½	1	1	11	1	2	4
4	2	5	2	9	3	3
4½	3	1	3	4	3	4
5	4	1	4	4	7	5
5½	6	3	5	7	5	10
6	10	6	14	7	2	8
6½	9	12	10	1	10	7
7	14	7	14	14	17	8
7½	—	—	—	—	—	—

WEIGHT OF CAST-IRON SOIL, WASTE, AND VENTILATING PIPES.

Internal diameter of pipe.	Average weight per 6ft. length.		
	1½ in. metal.	2 in. metal.	3 in. metal.
inches.	lbs.	lbs.	lbs.
2	26	30	34
2½	32	36	40
3	37	42	48
3½	43	48	54
4	48	54	60
4½	54	62	70
5	60	69	80
6	72	84	96
8	—	—	120
9	—	—	140

WEIGHT OF CAST-IRON SPIGOT AND SOCKET PIPES.

Suitable for water mains, &c., and capable of withstanding a hydraulic pressure of 300ft. head of water.

Diameter of pipes.	Length (exclusive of socket).	Thickness of metal.	Depth of socket.	Average weight per pipe.	Approx. weight per ft. run.
ins.	ft.	ins.	ins.	cwt. qr. lb.	cwt. qr. lb.
1½	6	3	3	0 1 14	0 0 7
2	6	3	3	0 2 0	0 0 9
2½	6	3	3	0 2 14	0 0 12
3	9	3	3	1 0 14	0 0 14
3½	9	3	3	1 1 0	0 0 16
4	9	3	3	1 1 21	0 0 18
4½	9	3½	3½	1 2 14	0 0 20
5	9	3½	3½	2 0 0	0 0 25
6	9	3½	3½	2 2 0	0 1 3
7	9	3½	3½	2 3 14	0 1 8
8	9	4	4	3 3 0	0 1 18
9	9	4	4	3 3 0	0 2 3
10	9	4	4	5 3 14	0 2 17
11	9	4½	4½	6 0 0	0 2 19
12	12	4½	4½	8 3 0	0 2 26
14	12	4½	4½	10 1 0	0 3 12
15	12	4½	4½	12 3 0	1 0 7
16	12	4½	4½	13 2 21	1 0 16
18	12	4½	4½	16 2 0	1 1 14
20	12	4½	4½	21 0 0	1 3 0
21	12	4½	4½	22 1 0	1 3 12
22	12	4½	4½	22 3 7	1 3 17
24	12	5	5	25 0 0	2 0 9
26	12	5	5	26 0 0	2 0 19
28	12	5	5	26 3 14	2 0 27
27	12	1	5	32 0 0	2 2 19
28	12	1	5	33 2 0	2 3 5
30	12	1	5	35 3 0	2 3 26
32	12	1	5	38 0 0	3 0 19
33	12	1	5	39 2 0	3 1 5
36	12	1½	5½	46 3 0	3 3 16
39	12	1½	5½	51 1 21	4 1 4
42	12	1½	5½	61 2 0	5 0 14
48	12	1½	5½	70 1 0	5 3 12

(To be continued.)

BRITISH FIRE PREVENTION COMMITTEE.

SPECIAL INDUSTRIAL SECTION.

A SPECIAL Industrial Section has now been started in connection with the British Fire Prevention Committee. It is open to all firms of ordinary business standing, and to responsible representatives of such firms.

It will mainly deal with everyday practical requirements of the community rather than with the research side of fire-prevention. The programme of this new section may be summarised as follows:—

(1) To assist the movement for better fire-protection inaugurated by the Committee, having special regard to the advantage of practical preventive measures.

(2) To bring together those interested in the management of offices, works, factories, mills, refineries, warehouses, &c., in order that special facilities for obtaining immediate information shall be available to all concerned (a) as to the requirements of public authorities; (b) as to approved methods of construction and equipment; (c) as to tests or experiments with fire-resisting materials or fire-appliances; (d) as to the experience gained at actual fires; and (e) as to the organisation of fire watches, private fire-brigades, &c.

(3) To afford facilities for combined action in respect to the requirements of the public authorities.

(4) To arrange periodical meetings for the purpose of discussing practical questions bearing on the subject; to publish and distribute such papers as are of special interest to members of the section; and to form such collections of models, appliances, records and statistics as may be useful for reference.

(5) To issue periodical warnings and notices to members, calling attention to specific risks or safeguards.

Each firm joining the section will be represented by one representative, who shall either be a principal, a director, manager, secretary or skilled adviser to the firm in question. Individual principals, directors, &c., are, however, eligible as members quite apart from the membership of their firm, but at no time shall more

than three members of the same firm belong to the section, and for all resolutions relating to the business of the section no one firm shall have more than one vote.

The annual subscription for every firm or individual becoming a member has been fixed at two guineas per annum, but for any individual member whose firm is already associated with the section the subscription will be one guinea per annum. The Committee's auditors include Mr. James (Messrs. James & Edwards), president of the Institute of Chartered Accountants, and all members of the Committee give their services voluntarily.

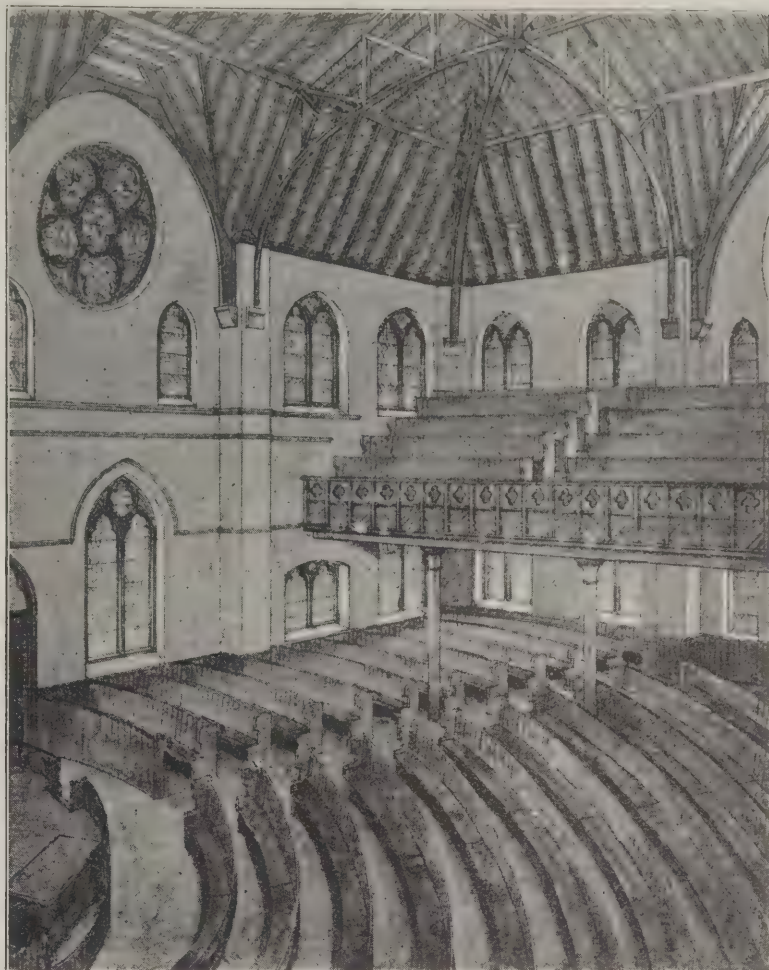
The section will elect its own chairman and vice-chairman, who will also have seats on the council of the General Committee, where they will represent the section in all matters relating to its particular interests.

Two Warnings.

The first "warning" issued by the section concerns night repairs and cleaning. It is as follows: "If cleaning or repair work by artificial light is undertaken when the works are otherwise closed, no individual job should on any account whatever be entrusted to a single-handed mechanic or workman. A second man should always be in attendance. Whenever such work is undertaken the watchman or fireman should receive due notice, and take such measures as to opening stop-valves, laying-out hose, and being personally in attendance, as may be deemed necessary. If portable lights are required they should be well-guarded lanterns, and on no account should petroleum, paraffin or mineral oils be used."

"Warning No. 2" relates to outside gas-cocks. It is as follows: "In many cases loss by fire has been much increased owing to the breaking of gas-pipes inside a building during the progress of a fire. Inside gas-cocks, even when placed near an entrance, are in such cases but seldom accessible owing either to heat or smoke. Attention is here called to the advisability of having *outside* gas-cocks to the main-supply pipes. Such outside cocks should be fitted to every individual building or block in such a manner that it can be easily worked by a key, and should preferably be placed on the wall of the main front of the premises in a suitable box. The position of these gas-cocks should be shown by a suitable plate. An indicator should be provided to show if the cock is on or off. The cock should be worked at least once a month by the responsible lampman of the establishment or by the watchman or fireman in charge of the premises."

The Coronation Stand in front of the Mansion House was tested by 350 policemen on Saturday last and found to be perfectly secure.



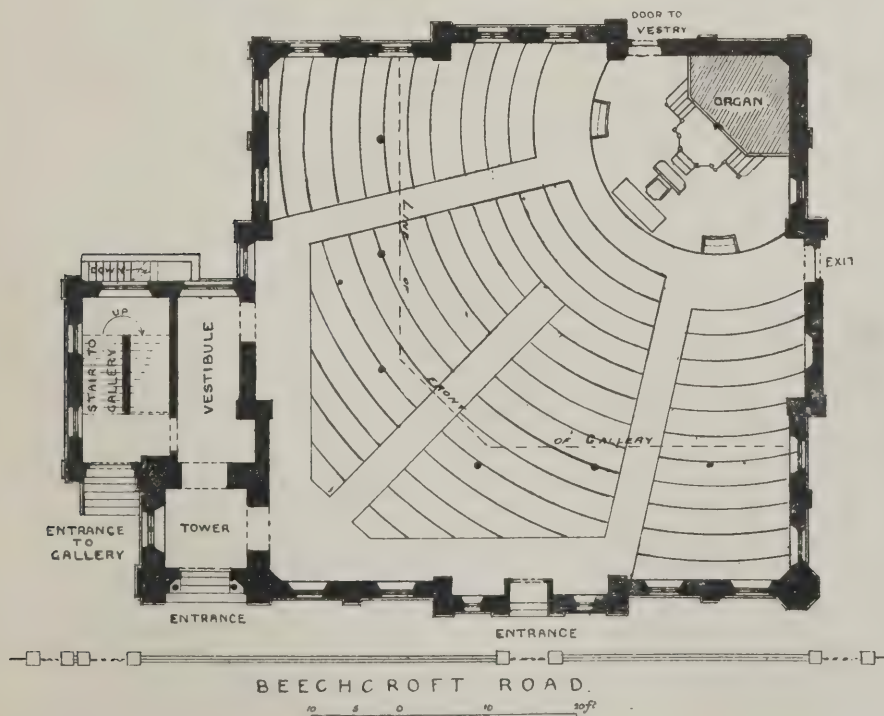
ST. PETER'S ENGLISH PRESBYTERIAN CHURCH, TOOTING, S.W.: INTERIOR VIEW FROM GALLERY. THOMAS ARNOLD, A.R.I.B.A., ARCHITECT.

A NEW CHURCH PLAN.

THE English Presbyterian Church at Tooting (a plan and interior view of which are given on this page) presents some features of interest in church design probably unique in this country, yet not uncommon in Canada and the United States, where many of the finest churches of recent years are erected on similar

lines. The foundation-stone was laid by Lord Strathcona and Mount Royal, High Commissioner for Canada. The plan of the church is very simple, being a square of 58ft. inside the walls. The pulpit, with the organ behind, is placed in one of the corners, and from it the pews are arranged in concentric lines, the passages radiating outwards to the entrances. The gallery occupies two sides and the angle opposite the pulpit. The area and gallery together provide seating accommodation for 720 persons. An important feature of the interior is the roof, which rises from the sides to the centre and is carried on open steel trusses, two of which spring from each of the side walls and meet in the middle; the roof itself resting on the trusses is of wood-boarding covered with felt and slates, carried by rafters of wood. The floor is of wood-block paving, sloping down from the entrances to the pulpit, and is carpeted throughout, so that all noise is prevented. The seats are cushioned. The windows give ample light from all sides.

It will be seen from the plan that the entrances and exits are abundant, and include a separate way by a fireproof staircase to the gallery. Externally the church is of brick with stone dressings to windows and doors. At the angle of the building is a spire and tower, marking the principal entrance, and the elevations are so designed that the difficulty of dealing with a square plan is entirely overcome. The heating is by hot-water at low pressure, and the lighting and ventilation are by Sugg's most approved system. The acoustics are most satisfactory alike to preacher, organist and congregation. The building was erected by Messrs. W. Johnson & Co., of Wandsworth Common (whose contract was £6,000, the total cost, including seating, gas-lighting, heating, organ, &c., amounting to about £8,000), from the designs and under the superintendence of Mr. Thomas Arnold, A.R.I.B.A. Ample space is left for the erection of lecture hall and classrooms.



COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
June 26	Plymouth—Boiler Seatings, Engine Bed, &c.	County Borough Council	J. Paton, Borough Engineer, Plymouth.
" 26	Cork—Sanitary Conveniences	T. Jones	City Engineer, Municipal Buildings, Cork.
" 26	Maesycwmmer, Wales—Villa Residence	Trustees	G. Kenshole, Architect, Station Road, Bargoed.
" 26	Spalding, Lincs—Minister's House	County Borough Council	Oalthorp & L. Harvey, Solicitors, Spalding.
" 26	Cork—Sanitary Conveniences	School Board	City Engineer, Municipal Buildings, Cork.
" 27	Aberdeen—School	Rev. T. Thorman	J. A. O. Allan, Board's Architect, 23 Union Terrace, Aberdeen.
" 27	Langley Moor, Durham—Schools	Benefit Building Society	H. T. Graddon, 22 Market Place, Durham.
" 27	Leadhills, Scotland—School	Corporation	Trail & Stewart, 1 Castlegate, Linark.
" 27	Rugby—Boundary Wall	School Board	J. T. Franklin, Architect, Regent Street, Rugby.
" 27	Thornton, Yorks—Twenty-nine Houses &c.	Wallasey Urban District Council	M. Hall, 29 Northgate, Halifax.
" 28	Walsall—Alterations, &c., to Tramway Depot	Marshall & Son	R. H. Middleton, Borough Surveyor, Walsall.
" 28	Wick—Offices and Boundary Walls at School	Town Council	D. W. Georgeson, Clerk, Board's Offices, Wick.
" 28	Seacombe, Cheshire—Waiting Rooms, &c., at Ferry	Alexandra Building Club	W. H. Travers, Engineer, Public Offices, Egremont, Cheshire.
" 28	Bodmin—Alterations, &c.	Rev. J. T. Beynon	W. J. Jenkins, Architect, Bodmin.
" 28	Devonport—Bridge Culvert	Trevethin School Board	Borough Surveyor, Devonport.
" 28	New Tredegar—Fifteen Dwelling-Houses	Guardians	G. Kenshole, Architect, Station Road, Bargoed.
" 28	Paincastle, Radnorshire—Vicarage	Guardians	R. W. Thomas, Architect, Llandrindod Wells.
" 28	Wendron, Cornwall—Stables, Cattle House, &c.	Guardians	G. T. Bowden, Farmhouse, Bodelrugan.
" 30	Abersychan—Gallery and Glass Screen at School	Parish Council	H. Blythway, Clerk, Pontypool.
" 30	Basford—Workhouse Alterations, &c.	Union Guardians	W. V. Batts, Architect, Bank Offices, Old Basford.
" 30	Kingston-on-Thames—Ambulance and Hearse Shed	Sanitorium Committee	J. Edzell, Clerk, Union Offices, Coombe Lane, Norbiton, Kingston-on-Thames.
" 30	Littleport, Ely—Cemetery Chapel	School Board	H. G. Martin, Surveyor, Littleport.
" 30	Morley—Greenhouses	Public Works Department	W. E. Putman, Borough Surveyor, Town Hall, Morley.
" 30	Pontefract—Schools	Great Northern Railway Co.	Tennant & Bagley, Architects, Pontefract.
" 30	Rochford, Essex—Workhouse Laundry	Sanitary Committee	Greenhalgh & Brockbank, Bank Chambers, Southend-on-Sea.
" 30	Middlesbrough—Brick Annexes, Septic Tanks, &c.	Corporation	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
" 30	Bedwas, Mon—Additions, &c., to School	Edinburgh Water Trust	J. H. Phillips, Architect, Olive Chambers, Windsor Place, Cardiff.
" 30	Cairo—Bookcase, Cupboards, &c., at Museum	Royal Norfolk and Suffolk Yacht Club	Chief of Administrative Service, Cairo.
" 30	Hornchurch—Extension, &c., of Church	School Board	F. W. Thompson, Berther Road, Hornchurch.
" 30	Dublin—Six Cottages	Electricity Committee	Company's Engineer-in-Chief, Amiens Street, Dublin.
" 30	Newcastle-upon-Tyne—Conveniences	Union Guardians	O. S. Errington, Archt., Victoria Bldgs., Grainger St. W., Newcastle.
" 30	Hastings—Portland Cement	Manchester Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
" 30	Brunston, Edinburgh—Sluice-Keeper's House	Royal National Lifeboat Institution	W. Boyd, Clerk, Water Trust Offices, Edinburgh.
" 30	Lowestoft—Yacht Club-House	Urban District Council	G. J. & F. W. Skipper, 7 London Street, Norwich.
July 1	Castledermot, co. Kildare—Methodist Church	School Board	Rev. G. Christie, Pembroke, Carlrow.
" 1	Pontypool—Altering and remodelling Hotel	Electricity Committee	T. Roderick, Architect, Clifton Street, Aberdare.
" 1	Winchester—Additions to School	Union Guardians	T. Stopher, 57 High Street, Winchester.
" 1	Nottingham—Repairs	Guardians	Secretary, Board's Offices, Victoria Street, Nottingham.
" 1	Manchester—Cement, &c.	Manchester Corporation	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
" 1	Ware—Vagrants' Block at Workhouse	Royal National Lifeboat Institution	O. Smith & Son, 164 Friar Street, Reading.
" 1	Olifhog, Turiff—Additions to Steading	Urban District Council	J. Duncan & Son, Architects, Turriff.
" 1	Uppermill and Pitglassie—Alterations to House and Steading, House, and Farm Steading	Admiralty	J. Duncan & Son, Architects, Turriff.
" 1	Plymouth—Kitchen Oven, &c., at Workhouse	Urban District Council	H. J. Snell, 11 The Crescent, Plymouth.
" 1	Chorlton-cum-Hardy, Manchester—Electricity Sub-Station	Rural District Council	City Architect, Town Hall, Manchester.
" 1	Whalley Range, Manchester—Electricity Sub-Station	School Board	W. T. Douglass, 15 Victoria Street, Westminster, S.W.
" 2	Skerries, co. Dublin—Lifeboat House	Hebron Welsh Congregational Church	F. S. Yates, surveyor, Town Hall, Waterloo.
" 2	Waterloo-with-Seaford—Conveniences and Alterations to Lodge	County Council	G. & I. Steane, 22 Little Park Street, Coventry.
" 2	Coventry—Repairs, &c., to Schools	Union Guardians	W. B. Chancellor, Town Surveyor, Public Buildings, Brownhills.
" 3	Brownhills, Staffs—Stabling	Borough Council	Rev. D. J. Jones, Congregational Minister, Cymmer, Port Talbot.
" 3	Port Talbot, Wales—Chapel	Llantrisant School Board	J. H. Garret, County Road Surveyor, Shire Hall, Worcester.
" 3	Yardley, Worcs—Bridge	Admiralty	R. J. Beswick, 35 Regent Street, Swindon.
" 3	Purton, Wilts—Alterations to Workhouse	Urban District Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 3	Woolwich—Twenty-five Houses	Metropolitan Railway Co.	J. Rees, Architect, Pentre, Rhonda.
" 4	Giffach Goch, Wales—Extension of Schools	Cottage Hospital Trustees	Director of Works Department, Admiralty, Northumberland Avenue, W.C.
" 4	Bradwell, near Southminster—Coast Guard Buildings	Rural District Council	Morley & Dawbarn, 82 Victoria Street, Westminster.
" 4	Bexley Heath, Kent—Electric Generating Station	Urban District Council	W. H. Spiller, Clerk, Council Offices, Clonakilty.
" 4	Clonakilty, Ireland—Labourers' Cottages	School Board	W. Seaton, Clerk, Town Hall, Swindon.
" 5	Swindon—School	Technical College Governors	H. F. Stockdale, 38 Bath Street, Glasgow.
" 5	Glasgow—College Buildings	Metropolitan Railway Co.	Secretary, 31 Westbourne Terrace, Paddington, W.
" 5	Neasden—Electrical Power House	Cottage Hospital Trustees	J. W. Leversedge, Architect, Wigan Road, Ashton-in-Makerfield.
" 5	North Ashton—Enlargement, &c., of Schools	Rural District Council	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.
" 7	Coventry—Bedroom and Alterations to Hospital	Bronhenlog Building Club	N. Fitzsimons, 82 Royal Avenue, Belfast.
" 7	Larne—Hospital Buildings	King's Norton Guardians	Bailey, Denton, Son, Lawford & Symons, Palace Chambers, Westminster.
" 7	South Stoneham—Engine and Boiler-House, Chimney, Cottages, &c.	Urban District Council	T. Roderick, Architect, Merthyr.
" 7	Penydaren, Wales—Sixty Workmen's Cottages	Charity Trustees	Whitwell & Son, Temple Row, Birmingham.
" 8	Selly Oak, Birmingham—Workhouse Mortuary and Dining Room	Metropolitan Asylums Board	A. C. Lee, Clerk, Manor House, Cheshunt.
" 9	Cheshunt—Twelve Workmen's Cottages	County Hospital Governors	J. Kirkby, Fosdyke.
" 10	Fosdyke—Pair of Cottages	Harbour Trustees	Treadwell & Martin, 2 Waterloo Place, Pall Mall, S.W.
" 16	Carsaltan, Surrey—Convalescent Hospital	Commissioners of Irish Lights	W. J. Morley & Son, 269 Swan Arcade, Bradford.
No date	Rotherham—Weeleyan Church	Corporation	Demaine & Brierley, 13 Lendal, York.
"	York—Nurses' Home	Urban District Council	
ENGINEERING:			
June 26	Dundee—Steel Hopper Barges	Urban District Council	J. Thompson, jun., Harbour Engineer, Dundee.
" 26	Dublin—Buoys	Corporation	Engineer, Irish Lights Office, Carlisle Buildings, Dublin.
" 27	Walsall—Booster and Switches	Gas Committee	A. Wyllie, Borough Electrical Engineer, Wolverhampton Street, Walsall.
" 28	Bollington, near Macclesfield—Waterworks	Gas Committee	W. H. Rudford, Albion Chambers, King Street, Nottingham.
" 28	Walsall—Widening Bridges, &c.	Corporation	Borough Surveyor, Bridge Street, Walsall.
" 28	Manchester—Steel Tanks	Halifax Board of Guardians	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
" 28	Barnstaple—Gas Purifier House	Urban District Council	J. O. Southcombe, Architect, Barnstaple.
" 28	Leeds—Incandescent Street Lamps	Waterworks Committee	Superintendent of Street Lighting, Municipal Buildings, Leeds.
" 30	Salterhebble—Steam-heating Mains at Hospital	Corporation	Shepherd & Watney, Consulting Engineers, Greek St. Chhrs, Leeds.
" 30	Komford—Electricity Supply Works	Great Northern Railway Co. (Ireland)	C. T. King, Clerk, Council Offices, Romford.
" 30	Dakinfield, Cheshire—Widening Bridge	Urban District Council	R. F. Bull, County Bridgmaster, "The Castle," Chester.
" 30	Manchester—Valves, &c.	Industrial Society, Limited	G. H. Hill & Sons, 3 Victoria Street, Westminster.
" 30	Middlesbrough—Floods Prevention Scheme, &c.	Harbour Commissioners	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
" 30	Oldcastle and Dugganagh—Station Roofs	Northumberland County Council	Company's Engineer-in-Chief, Amiens Street Terminus, Dublin.
" 30	Gildersome, Yorks—Sewage-Disposal Works	Corporation	J. Waugh, Engineer, Sunbridge Chambers, Bradford.
" 30	Sydney, N.S.W.—Bridge across Harbour	East Indian Railway Company	Under-Secretary for Public Works, Sydney.
July 1	Pilwell, Carnarvonshire—Harbour Works	Worcester County Council	W. T. Douglass, 15 Victoria Street, Westminster, S.W.
" 1	Church Lawton—Laying Water Mains	Dock & Warehouse Extension Co., Ltd.	C. R. Hall, 1 West Street, Congleton.
" 2	Manchester—Incandescent Lamps, &c.	Urban District Council	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
" 2	Ludendenfoot—Iron Foot-bridge across River	Urban District Council	W. H. Ockroft, Architect, West End, Hebdon Bridge.
" 3	Lundon E.O.—Brake Vans, &c.	Urban District Council	C. W. Young, Secretary, Nicholas Lane, E.C.
" 3	Yardley—Rebuilding Bridge	Urban District Council	J. H. Garrett, County Road Surveyor, Shirehall, Worcester.
" 3	Manchester—Dock Works, &c.	Urban District Council	W. H. Hunter, 41 Spring Gardens, Manchester.
" 4	Bexley Heath, Kent—Steelwork for Electric Generating Station	Urban District Council	Morley & Dawbarn, 82 Victoria Street, Westminster.
" 4	Willington Quay—Electrical Equipment	Industrial Society, Limited	Secretary, Society's Offices, Bewick Road, Willington Quay.
" 4	Aberdeen—Steel swingbridge and Machinery	Harbour Commissioners	R. G. Nichol, Engineer, Aberdeen.
" 5	Newcastle-on-Tyne—Bridge Works	Northumberland County Council	J. A. Bean, County Surveyor, Moothall, Newcastle-on-Tyne.
" 5	Ipswich—Electric Lighting Plant	Corporation	W. Bauhoff, Town Clerk, Town Hall, Ipswich.
" 7	Stalybridge—Electrical Plant	Tramways and Electricity Board	F. Senefeld, Clerk, Town Hall, Stalybridge.
" 7	Bexley Heath—Points and Crossings, &c.	Urban District Council	Morley & Dawbarn, 82 Victoria Street, Westminster, S.W.
" 7	South Stoneham—Sewerage Works	Rural District Council	Bailey, Denton, Son, Lawford & Symons, Palace Chhrs, Westminster.
" 8	London, S.W.—Steam Piping, &c.	London County Council	County Hall, Spring Gardens, S.W.
" 8	West Ham—Electric Trams	Corporation	J. K. Bock, Borough Electrical Engineer, Abbey Mills, West Ham.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
July 9	Sunderland—Electric Tramway	Corporation	J. F. O. Snell, Borough Electrical Engr., Town Hall, Sunderland.
" 9	Epsom, Surrey—Bacteria Beds	Rural District Council	Bees'cy, Son & Nichols, 11 Victoria Street, Westminster.
" 10	Castleford—Main Laying	Urban District Council	W. Green, Surveyor, Council Offices, Castleford.
" 10	Potterhamworth, Lincs—Water Supply Works	Urban District Council	J. Clare, Engineer, Sleaford.
" 15	Bombay—Providing and Laying Steel Mains	Bransford Rural District Council	Executive Engineer, Bombay.
Sept. 14	St. Petersburg, Russia—2 Bridges over River Neva	—	The Delegation Municipale, St. Petersburg.
No date	Lichfield—Foundns., Drains & Water-Supply Connctns.	Workhouse Guardians	D. O. Marks, Architect, St. Mary's Chambers, Lichfield.
IRON AND STEEL:			
June 26	Nottingham—Pipes, Valves, &c.	Water Committee	S. Moore, Water Manager, St. Peter's Church Side, Nottingham.
" 28	Dewsbury—Cast-iron Pipes	Waterworks Board	H. Dearden, Engineer, Town Hall, Dewsbury.
" 28	Kirkburton, Huddersfield—Cast-Iron Pipes	—	H. Dearden, Engineer, Town Hall, Dewsbury.
July 1	Manchester—Castings, &c.	Electricity Committee	F. E. Hughes, Sec., Electricity Department, Town Hall, Manchester.
" 2	London, E.O.—Wheels, Axles, &c.	East Indian Railway Co.	O. W. Young, Secretary, Nicholas Lane, E.O.
" 3	Amsterdam—Railway Materials, &c.	Government	M. Nighoff, Bookseller, The Hague.
" 3	Bethnal Green—Cast-iron Manholes and Dust Pails	Borough Council	Chief Inspector, Public Health Dept., Town Hall, Bethnal Green.
" 4	Bexley Heath, Kent—Steelwork for Elec. Gen. Station	Urban District Council	Morley & Dawbarn, 82 Victoria Street, Westminster.
" 5	Glasgow—Wright Work for College Buildings	Technical College Governors	H. F. Stockdale, 28 Bath Street, Glasgow.
" 16	Cheltenham—Cast-iron Water Main	Corporation	J. Hall, Waterworks Engineer, Municipal Offices, Cheltenham.
PAINTING AND PLUMBING:			
June 26	Nottingham—Lead Piping, &c.	Water Committee	S. Moore, Water Manager, St. Peter's Church Side, Nottingham.
" 28	Whitwood Mere, Castleford—Whitewashing Schools	School Board	J. Redpath, 72 Methley Road, Whitwood Mere.
" 30	East Ham—Cleaning, Whitewashing, &c.	School Board	H. O. Padgett, Clerk, School Board Office, East Ham, E.
" 0	Sheffield—Painting, Decoration, &c., at School of Art	Technical Instruction Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 30	Banff—Painting at Asylum	District Lunacy Board	Kelly & Nichol, 367 Union Street, Aberdeen.
" 30	Handsworth, Staffs—Painting	Urban District Council	H. Richardson, Surveyor, Council House, Handsworth.
" 30	Soothill, Dewsbury—Painting at Schools	School Board	J. Croft, Clerk, Market Place, Dewsbury.
" 30	Swindon—Painting and Repairs at Schools	School Board	W. Seaton, Clerk, Town Hall, Swindon.
" 30	Leeds—Painting, Colouring, &c., in Schools	School Board	W. Packer, Clerk, School Board Offices, Leeds.
July 1	Yardley, Birmingham—Cleaning, Painting, &c., Schools	School Board	A. Harrison, 109 Colmore Road, Birmingham.
" 1	Rotherham—Painting, &c., Schools	School Board	W. H. Corbridge, Clerk, Board's Offices, Rotherham.
" 1	Glasgow—Painting at Schools	George Heriot's Trust	Mr. Anderson, Superintendent of Works, 20 York St., Edinburgh.
" 1	Wisbech—Painting at Schools	School Board	F. B. Ward, Architect, York Row, Wisbech.
" 2	Sheffield—Painting, &c., Schools	School Board	J. F. Moss, Clerk, Board's Offices, Sheffield.
" 3	Whiston Prescot—Cleaning and Painting Infirmary	Prescot Union Guardians	J. Gandy, Architect, St. Helens.
" 4	Hull—Cleaning and Distemping at Workhouse	Sculcoates Union Guardians	T. B. Atkinson, 11 Trinity House Lane, Hull.
ROADS AND CARTAGE:			
June 26	Nantwich—Street Works	Urban District Council	W. F. Newey, Market Street, Nantwich, Surveyor.
" 26	Paisley—Causewaying	Town Council	Borough Surveyor, 13 Gilmour Street, Paisley.
" 26	Paisley—Road Metal	Town Council	Borough Surveyor, 13 Gilmour Street, Paisley.
" 26	Stockport—Making up Streets	Highways and Sewers Committee	J. Atkinson, Borough Surveyor, St. Peter's Gate, Stockport.
" 27	Springburn, Glasgow—Roadways & Walls at Hospital	Parish Council	J. Thomson & R. D. Sandilands, 241 West George Street, Glasgow.
" 28	Surbiton—Street Works	Urban District Council	Clerk, Offices, Ewell Road, Surbiton.
" 28	Walsall—Widening Roads	Corporation	Borough Surveyor, Bridge Street, Walsall.
" 30	Bolton-upon-Dearne, Yorks—Street Works	Urban District Council	J. L. Hawksworth, Clerk, Bolton-upon-Dearne, Rotherham.
" 30	East Dereham—Granite	Urban District Council	H. G. Himson, Surveyor, Theatre Street, East Dereham.
" 30	Farnborough—Materials	Urban District Council	J. E. Hargreaves, Surveyor, Offices, Farnborough.
" 30	Morley, Yorks—Tar Macadam	Urban District Council	W. E. Putman, Borough Engineer, Town Hall, Morley.
" 30	Goldthorpe—Street Works	Urban District Council	J. L. Hawksworth, Clerk, Bolton-upon-Dearne.
" 30	Sandal Magna—Street Drainage Works	Bolton-upon-Dearne U.D.C.	F. Massie, Tetley House, Wakefield.
July 1	Waltham Abbey—Furnace Slag	Urban District Council	W. T. Streather, Surveyor, Council Offices, Waltham Abbey.
" 1	Tottenham—Making-up Roads	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
" 1	London, S.E.—Ten Slop Vans, Cart, &c.	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Spa Road, S.E.
" 1	Withington, Lancs—Street and Passage Works	Urban District Council	A. H. Mountain, Surveyor, Town Hall, West Didsbury.
" 1	Manchester—Flags, &c.	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
" 2	Lewes—Steam Rolling	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
" 2	Clacton-on-Sea—Making-up Parade	Urban District Council	A. R. Robinson, Council's Surveyor, Town Hall, Clacton-on-Sea.
" 2	North Walsham, Norfolk—Materials	Urban District Council	E. J. Simpson, Surveyor, North Walsham.
" 2	North Walsham—Granite	Urban District Council	E. J. Simpson, Surveyor, North Walsham.
" 3	Wanstead, Essex—Stone	Urban District Council	W. Blewitt, Clerk, Council Offices, Wanstead, N.E.
" 3	Midhurst, Sussex—Steam Road Roller	Urban District Council	A. G. Gibbs, Surveyor, Council Offices, Midhurst.
" 3	Wanstead—Steam Roller, &c.	Urban District Council	O. H. Bressey, Surveyor, Council Offices, Wanstead, N.E.
" 4	Branksome, Dorset—Granite	Urban District Council	S. J. Newman, Surveyor, Council Offices, Branksome.
SANITARY:			
June 30	Gildersome, Yorks—Sewage-disposal Works	Urban District Council	J. Waugh, Engineer, Sunbridge Chambers, Bradford.
" 30	Prestwich, Lancs—Sewer	Urban District Council	Surveyor, Council Offices, Chester Bank, Prestwich.
" 30	Sandal Magna, near Wakefield—Drainage Works	Urban District Council	F. Massie, Engineer, Tetley House, Wakefield.
" 30	Middlesbrough—Septic Tanks, Bacteria Beds, &c.	Sanatorium Committee	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
July 1	Hounslow—Sewers	Urban District Council	P. G. Parkman, Engineer, Town Hall, Hounslow.
" 7	Nuneaton—Sewers, &c.	Urban District Council	J. S. Pickering, Engineer, Council Offices, Nuneaton.
" 7	Sheffield—Lime	United Gas Light Co.	H. Thomas, General Manager, Commercial Street, Sheffield.
" 7	South Stoneham—Sewerage Works	Rural District Council	Bailey, Denton, Son, Lawford & Symons, Palace Chambers, Westminster.
" 7	South Stoneham—Sewerage Works	Rural District Council	Bailey, Denton, Son, Lawford & Symons, Palace Chambers, Westminster.
" 9	Epsom, Surrey—Bacteria Beds	Rural District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster.
" 10	London, S.E.—Reconstructing Drainage, &c.	Southwark Union Guardians	G. D. Stevenson, 13 & 14 King Street, Cheapside, E.O.
" 10	Surbiton—Stoneware Pipe Storm-water Drains	Urban District Council	F. J. Bell, Deputy Clerk, Ewell Road, Surbiton.
" 12	Runcorn—Sewerage Works	Rural District Council	W. H. Radford, Engineer, Albion Chambers, Nottingham.
TIMBER:			
June 28	Genoa—Wood and Wooden Articles	Italian Navy	Commercial Intelligent Branch, Board of Trade, 50 Parliament St.
" 31	Launceston—Timber, &c., for Show	Agricultural Association	F. T. Kinton, Hon. Sec., Launceston.
July 1	Manchester—Timber, &c.	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
" 5	North Walsham—Wood Block Floors	School Board	Bottle & Olley, 5 Queen Street, Great Yarmouth.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June 27	West Hartlepool—School	£75, £35.	J. R. Smith, Clerk, School Board Offices, West Hartlepool.
" 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Jauncey House, South John Street, Liverpool.
July 19	Aylesbury—Monument	—	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
" 26	Clacton-on-Sea—Board School	—	O. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	O. H. J. Talmage, Southchurch Road, Warnor Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk Liverpool.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.C. Offices, Tottenham.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.
No date	Kirkley—Wesleyan Church	—	Rev. R. H. Higson, Lowestoft.
"	Mullingar, Ireland—Hot-Water System for Institute	—	Rev. N. Woods, Mullingar.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRUTON (SOMERSET).—For two new class-rooms, laboratory, &c., at the King's School, Bruton, Somerset. Mr. Arthur J. Pictor, A.R.I.B.A., architect, Bruton, Somerset:—
R. J. Stead, Glastonbury £230 0
T. Lyford, Castle Cary 609 18
W. Clarke & Son, Bruton 678 10
T. S. Hobbs, Bruton 649 0
* Accepted.

DAWLISH.—For the erection of a stable and coach house buildings, &c., at Holcombe Hall, for Mr. Harrison Henn. Messrs. J. W. Howell & Son, architects, Newton Abbot. Quantities by Mr. Vincent Catermole Brown, Paignton:—
Lamcraft & Sons, Dawlish £2,400 0
F. Friend, Dawlish 2,579 0
F. C. Francis, Teignmouth 2,214 0
E. Andrews, Teignmouth 2,202 10
G. Lee, Teignmouth 1,998 17
* Accepted.

DINNINGTON (NORTHUMBERLAND).—For Dinnington sewerage and sewage-disposal works, for the Castle Ward Rural District Council. Mr. Harry W. Taylor, A.M.I.C.E., engineer, Newcastle-on-Tyne and Birmingham:—
J. W. Robson, Newcastle-on-Tyne £2,308
J. Robson, Newcastle-on-Tyne 2,250
J. Bewley, Dunston-on-Tyne 2,253
G. K. Waghorn, Redcar 2,405
J. Carrick, Durham 1,876
J. Thompson, Gosforth, Newcastle-on-Tyne 1,818
* Accepted.

FENHAM (NORTHUMBERLAND).—For the construction of about 5,000 lineal yards of 21-in., 24-in., and 27-in. main sewers from Scotswood to Fenham, together with the necessary manholes, storm overflows, and a screening and outfall chamber with cast-iron pipe in the river bed, for the Benwell and Fenham Urban District Council. Mr. Henry W. Taylor, A.M.I.C.E., F.S.I., engineer, St. Nicholas Chambers, Newcastle-on-Tyne:—
Sewers with ordinary socketed joints.
G. E. Simpson, Newcastle-on-Tyne £21,501
G. Bell, Manchester 17,899
J. Carrick, Durham 16,835
J. Bewley, Dunston-on-Tyne 14,850
J. Thompson, Gosforth 13,957
M. D. Young, Hexham 13,957
W. J. Foster, West Hartlepool 13,500
J. Robson, Newcastle-on-Tyne 12,995
E. & A. Storey, Benwell, Newcastle 12,512
M. A. Armstrong, Blaydon-on-Tyne 8,252
* Accepted.

GREAT YARMOUTH.—For the erection of new premises on South Docks for Smith's Dock Trust, Ltd. Messrs. Bottle & Olley, architects, 5 Queen Street, Great Yarmouth:—
John Eastoe £6,776 0 0
J. Youngs & Son, Norwich 6,257 0 0
Searles Bros., Norwich 6,100 0 0
J. S. Smith, Norwich 5,990 0 0
J. S. Read 5,740 10 0
Carter & Wright 5,680 0 0
F. Grimble 5,600 0 0
J. D. Harman 5,572 0 0
S. & F. Smith 5,250 0 0
A. Gunns 5,217 0 0
J. Ward 5,183 19 6
C. Wiseman 5,150 0 0
J. F. W. Bray 4,840 0 0
A. E. Bondt 4,777 0 0
* Accepted. [Rest of Great Yarmouth.]

HENGOED (CARDIFF).—For the erection of six houses at Hengoed for Messrs. Rees, Rees & Co. Mr. P. Vivian Jones, P.A.S.I., architect and surveyor, Hengoed, via Cardiff:—
T. F. Howells, Caerphilly £1,500
W. Williams & Co., New Tredegar 1,470
J. H. James, 13 Kincraig Street, Cardiff 1,440
* Accepted.

LONDON.—For alterations and additions to the Royal Pavilion Hotel, Woolwich. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London, E.C. Quantities supplied:—
T. Osborne & Sons £4,354
Fred. T. Thorne 4,329
Courtney & Fairburn 4,289
Todd & Newman 4,217
Thomas & Edge £4,197
Green & Smith 4,190
Sheffield Bros. 3,987
* Accepted.

LONDON.—For alterations at the "Prince Alfred," Poplar, E. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London, E.C. Quantities supplied:—
Thos. Osborn & Sons £2,850
Fred. T. Thorne 825
Courtney & Fairburn 765
Harris & Wardrop £2,707
Sheffield Bros. 670
Samuel Salt* 649
* Accepted.

LONDON, S.E.—For the erection of a mission institute, Brisbane Street, Camberwell, for the Rev. F. D. Vaughan. Mr. Richard J. Lovell, architect, 40 Queen Victoria Street, E.C. Quantities by Mr. W. H. Webber, 7 Great James Street, W.C.:—
Coles & Co. £3,076
L. H. & R. Roberts 6,432
Bulled & Co. 6,371
Marsland & Co. 6,335
Mardes & Harper 6,254
W. Downes 6,252
Roome & Co. 5,719
Ivory* 5,905
* Accepted.

LONDON, N.E.—For supply of boilers and water-softening plant, for the Hackney Borough Council:—
Boilers.
E. Danks & Co., Oldbury £9,594 0
R. Hornsby & Sons 7,629 0
J. Thompson 7,385 0
W. R. Renshaw & Co. 6,995 6
Hughes & Stirling 6,954 0
Babcock & Wilcox* 6,910 5
Stirling Boiler Co. 6,553 0

Water-softening plant.
J. Thompson 2,485 0
J. Wright & Co. 2,442 0
Porter-Clark Water Softening Co. 2,201 0
Sir Hiram Maxim Electric and Engineering Co. 2,140 0
Mather & Platt 1,785 0
Potter & Co. 1,725 0
Doulton & Co. 1,696 0
Stanhope Water Engineering Co. 1,628 0
Masson, Scott & Co. 1,540 0
Purifier, Ltd. 1,480 10
Lessen & Hort 1,300 0
Baker's Patent Appliances Company 1,206 0
Babcock & Wilcox* 1,120 0
J. Barrett 1,070 0
Desrumaux's Automatic Water Softener and Glasgow Patents Co. 1,043 0
* Recommended for acceptance.

LONDON, W.—For the erection of two houses in Bolton Street, Piccadilly, London, W. Mr. W. Wonnacott, A.R.I.B.A., architect, Berkeley House, Berkeley Square, W.:—
Extra for Fireproof Floors.

J. Andrews & Sons £13,750
G. H. Bywaters & Sons £385
Prestige & Co. 267
J. Carmichael 397
Colls & Sons 305
W. Johnson & Co. 230
Patman & Fotheringham* 421
* Accepted.

MACDUFF, N.B.—Accepted for the erection of a manse, Macduff, N.B. Mr. F. D. Robertson, architect, Keith, Banffshire:—
Mason work—William Davidson, Huntly.
Carpenter work—Andrew Bonnyman, Knock Station.
Slater work—Alfred G. Ross, Macduff.
Plaster work—James Simpson, Macduff.
Plumber work—John Wilson, Huntly.
Painter & Glazier's work—Alex. Chalmers, Banff.
Total, including walls, railings, &c., £760.

MACROOM (IRELAND).—For the erection of a town hall, for the Macroom Urban Council:—
J. Ring, Macroom £1,550

D. Murphy, Dunmanway 1,460
Buckley Bros., Ovens, co. Cork 1,320
* Accepted subject to the approval of the Local Government Board.

MERTHYR TYDFIL.—For the erection of 45 houses at Merthyr Tydfil for the Saxon Building Club. Mr. P. Vivian Jones, P.A.S.I., architect and surveyor, Hengoed, via Cardiff:—
Tate & Eastwood, Market Harborough £10,545
Lloyd & Tape, Merthyr Tydfil 8,940
J. H. James, 13 Kincraig Street, Cardiff 8,900
Rd. Lloyd, Merthyr Tydfil 8,426
* Accepted.

NEWTON ABBOT.—For the erection of a free library and technical schools for the Urban District Council:—
Both Buildings. Free Library only.

Barton, Bristol £7,802
Pethick, Plymouth 7,785
Brenton, Torquay 7,052
L. Bearnie, Newton Abbot 6,497
Allen & Tozer, St. Budeaux 6,166
Richards, Plymouth 6,290
Stacey, Newton Abbot 6,179
J. Edwards, Newton Abbot 5,890
Goss, Torquay 5,833
Parker Bros. 2,490
* Accepted.

SHEFFIELD.—For the erection of covered yard, barrel-washing shed, and cooper's shop to Hope Brewery, Mowbray Street, for Messrs. the Directors of Carte, Milner and Bird, Limited. Messrs. Hall and Fenton, architects and surveyors, 14 St. James Row Sheffield. Quantities by the architects:—
Eshelby & Sons £1,705 0
A. Moore 1,731 0
G. Webster 1,725 0
G. Malpas 1,658 0
T. Astbury 1,651 0
A. Bradbury 1,643 0
Longdon & Sons, Ltd., Neepsend 1,619 0
Mastin & Son 1,599 0
G. Allen 1,590 0
Martin & Hughes 1,583 0
T. Margerrison, Dronfield 1,545 0
Dyson, Son, and Gregory, London Road 1,513 5
* Accepted. [Rest of Sheffield.]

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SELKIRK.—For the burgh of 'Selkirk waterworks (Contract No. 3), intake and gravitating main to engine-house. Mr. Harry W. Taylor, A.M.I.C.E., engineer, Newcastle-on-Tyne and Birmingham.—

R. C. Brebner & Co., Edinburgh... ..£2,320
D. MacDonald & Son,* Hawick... ..2,504
G. K. Waghorn,† Redcar... ..2,300
* Accepted.
† Withdrawn.

TON (PENTRE, RHONDDA VALLEY).—For the erection and completion of 41 or more houses at Co-operative Street, Ton, Pentre, Rhondda Valley, for the Ton Industrial Co-operative Society, Limited. Mr. W. D. Morgan, architect, Victoria Chambers, Pentre, Rhondda Valley:—

A. Richards, Pentre, Rhondda... ..£2,855 0
E. Jones, Cwmparc, Rhondda... ..8,401 10
Morgan Bros.* Ton, Pentre, Rhondda Valley 8,085 0
T. Reynolds,† Ystrad, Rhondda... ..7,025 0
* Accepted.
† Withdrawn.

WALTHAMSTOW.—For additions, &c., to the Walthamsow Hospital. Messrs. Pennington & Son, architects, Hastings House, Norfolk Street, Strand, W.C.:—

W. R. Rens... ..£6,970
Foster Bros... ..6,720
J. A. Reed... ..6,273
S. J. Scott... ..6,141
Thomas & Edge... ..6,135
Barret & Power... ..6,050
R. A. Lowe... ..5,995

A. G. Barton... ..£5,905
J. Appleby... ..5,800
Shewin Bros... ..5,787
W. Shurmer... ..5,778
P. Banyard,* Cambridge 5,400
West Bros. & Pettit... ..5,051
* Accepted.

WEST HAM.—For making up the following streets, for the West Ham Town Council, Berwick Road, Garvary Road (part), Throckmorton Road (part), Chesterton Road (part), Crows Road, Beckton Road (part). Mr. John G. Morley, borough engineer:—

Group 1.		
W. Griffiths & Co., Ltd., Hamilton House, Bishopsgate Street, E.C.	...	£2,025 15 0
Wilson, Border & Co., 1 Derby Gardens, Ilford	...	2,594 0 10
T. Adams, Green Lanes Goods Station, Wood Green	...	2,578 7 7
J. Jackson, Broadway, Plaistow	...	2,476 16 8
W. H. Wheeler, 235 Blackfriars Road, S.E.	...	2,430 0 0
D. T. Jackson,* 104 Ripple Road, Barking	...	2,389 18 0
Group 2.		
J. Jackson	...	2,500 1 9
W. Griffiths & Co., Ltd.	...	2,400 5 7
Wilson, Border & Co.	...	2,414 9 9
T. Adams	...	2,305 6 6
D. T. Jackson*	...	2,285 8 6
Group 3.		
W. Griffiths & Co., Ltd.	...	5,715 9 7
Wilson, Border & Co.	...	5,593 11 0
D. T. Jackson	...	5,458 17 6
T. Adams	...	5,388 2 11
J. Jackson*	...	5,378 11 3
* Accepted.		

BUILDERS' FOREMEN'S AND CLERKS OF WORKS' INSTITUTION.—Half-yearly Meeting of Directors at 8 p.m.

Thursday, June 26.
ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Visit to Salisbury Cathedral.

Friday, June 27.
PHYSICAL SOCIETY.—Meeting at 5 p.m.

Saturday, June 28.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Excursion to Carlisle and Lanercost. Visits to Carlisle Cathedral, Castle and Town Hall, and Nawarth Castle, and Lanercost Priory.

Tuesday, July 1.
INSTITUTE OF ELECTRICAL ENGINEERS.—Conversazione at the Natural History Museum, Cromwell Road, to meet the Members of the Incorporated Municipal Electrical Association and the Foreign Delegates to the International Tramways and Light Railways Congress.
SOCIETY FOR THE PROMOTION OF HELLENIC STUDIES.—Annual Meeting at 5 p.m.

COMING EVENTS.

Wednesday, June 25.
GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

“SPECIFICATION.”

COMPLETE SETS.

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POSTAGE EXTRA.

Early application should be made, as after the present stock is exhausted, it is unlikely that further copies will be obtainable.

“SPECIFICATION” No. 6 (1903) is now in course of preparation, and Subscriptions should be sent in without delay.

SPECIAL NOTICE TO ADVERTISERS.

The most important point to be considered by an Advertiser—next to the selection of the medium—is the question of the position his announcement occupies.

In “SPECIFICATION” the Advertisements are arranged to face the particular matter to which they relate; but the demand for these “facing matter” positions has been so great (more than 100 pages have already been booked) that there are very few left, and these will allotted in strict order of application.

Immediate notice should therefore be given to the Advertisement Manager of space required.

A BROCHURE giving full particulars of the 1903 Issue will be sent post free on application.

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Hay, best .. do.	5 5 0	5 12 6	
Sainfoin mixture .. do.	4 10 0	5 5 0	
Straw .. do.	1 10 0	2 4 0	

OILS AND PAINTS.			
	£ s. d.	£ s. d.	
Castor Oil, French .. per cwt.	1 5 1	1 6 0	
Colza Oil, English .. do.	1 7 6	—	
Copperas .. per ton	2 0 0	—	
Lard Oil .. per cwt.	2 12 0	2 12 6	
Lead, white, ground, carbonate do.	1 4 10	—	
Do. red .. do.	1 0 4	—	
Linseed Oil, barrels .. do.	1 10 3	—	
Petroleum, American .. per gal.	0 0 6	0 0 6	
Do. Russian .. do.	0 0 5	—	
Pitch .. per barrel	0 7 0	—	
Shellac, orange .. per cwt.	5 8 0	—	
Soda, crystals .. per ton	3 2 6	3 5 0	
Tallow, Home Melt .. per cwt.	1 12 0	1 12 6	
Tar, Stockholm .. per barrel	1 2 6	—	
Turpentine .. per cwt.	1 17 6	—	

METALS.			
	£ s. d.	£ s. d.	
Copper, sheet, strong .. per ton	65 0 0	—	
Iron, Staffs, bar .. do.	6 7 6	8 10 0	
Do. Galvanised Corrugated sheet .. do.	11 10 0	11 15 0	
Lead, pig, Soft Foreign .. do.	11 3 9	11 5 0	
Do. do. English common brands .. do.	11 10 0	—	
Do. sheet, English 3lb per sq. ft. and upwards .. do.	13 5 0	—	
Do. pipe .. do.	13 15 0	—	
Nails, cut clasp 3in. to 6in. .. do.	9 5 0	—	
Do. floor brads .. do.	9 0 0	—	

Steel, Staffs, Girders and Angles.			
	£ s. d.	£ s. d.	
Do. do. Mild bars .. do.	5 15 0	6 5 0	
Tin, Foreign .. do.	127 10 0	123 0 0	
Do. English ingots .. do.	129 0 0	130 10 0	
Zinc, sheets, Silesian .. do.	21 0 0	—	
Do. do. Vieille Montaigne .. do.	24 10 0	—	
Do. Spelter .. do.	18 13 9	18 17 6	

TIMBER.			
SOFT WOODS.			
	£ s. d.	£ s. d.	
Fir, Dantzic and Memel .. per load	3 0 0	4 10 0	
Pine, Quebec, Yellow .. per load	4 7 6	6 0 0	
Do. Pitch .. do.	2 14 0	8 12 0	
Laths, log, Dantzic .. per fath.	4 10 0	5 10 0	
Do. Petersburg .. per bundle	0 8	—	
Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0	
Do. do. 4th & 3rd .. do.	8 10 0	15 15 0	
Do. do. unsorted .. do.	5 12 6	6 10 0	
Do. Riga .. do.	6 15 0	12 10 0	
Deal, Petersburg 1st Yellow .. do.	16 5 0	—	
Do. do. 2nd .. do.	9 0 0	12 10 0	
Do. do. White .. do.	7 5 0	12 10 0	
Do. Swedish .. do.	8 15 0	12 10 0	
Do. White Sea .. do.	13 5 0	17 5 0	
Do. Quebec Pine, 1st .. do.	11 10 0	24 10 0	
Do. do. 2nd .. do.	22 5 0	—	
Do. do. 3rd & 4th .. do.	9 10 0	—	
Do. Canadian Spruce, 1st .. do.	7 10 0	12 10 0	
Do. do. 3rd & 2nd .. do.	7 0 0	9 10 0	
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Battens, all kinds .. do.	7 0 0	10 5 0	

FLOORING.			
	£ s. d.	£ s. d.	
Do. prepared, 1st .. per square	0 8 9	0 9 9	
Do. 2nd .. do.	0 10 0	0 10 3	
Do. 3rd & 4th .. do.	0 7 6	0 9 0	
HARD WOODS.			
Ash, Quebec .. per load	3 17 6	4 10 0	
Birch, Quebec .. do.	3 12 6	3 17 6	

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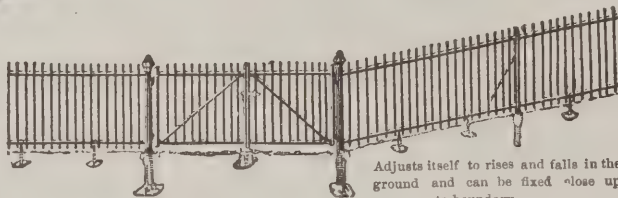
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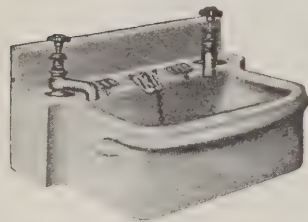
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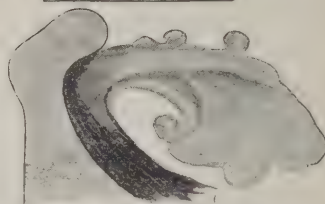
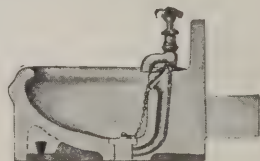
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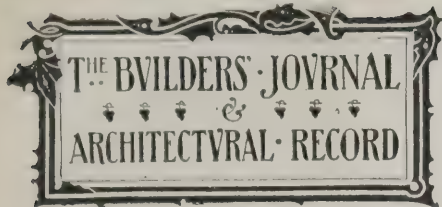
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An Architectural Causerie.

Sir William
Emerson.

THE Coronation honours have been generous enough in their recognition of science and art,

and we are sure the architectural profession are glad to see the name of Mr. William Emerson included in the list of new knights. At such a time as this it would be indecorous on our part to make any comment on the selection. Mr. Emerson has been honoured as president of the Royal Institute, and though there may be one or two other men who have done greater service to architecture, the royal recognition of the profession in this manner is not only a personal honour to Mr. Emerson but to the whole body of architects; and we trust that the practice will be followed more often in the future than it has in the past. In looking over the names of our architects we find very few with titles to them. Just now there are two—Sir William Emerson and Sir Thomas Drew. Let us hope that other honourable names may add similar lustre to the profession (or art) of architecture. We are also glad to see that Mr. G. F. Watts, R.A., has been made a recipient of the new "Order of Merit." Mr. Watts has twice refused a baronetcy, but it is gratifying to see this grand old artist thus honoured in his eighty-fifth year.

Restorers
at Conway.

RESTORERS are always busy-ing themselves. At Conway they now propose to "restore"

the Queen's tower of the castle, because it is alleged to be in a very ruinous condition. Mr. C. H. Bothamley observes that the tower is certainly in such a condition if by this is meant that the ornamental detail of the oratory has practically all perished, but so far as the stability of the tower itself is concerned there is no need for these busybodies to energize themselves; "both internally and externally the tower seems to be quite sound, some repairs that were necessary in the interior having recently been well carried out by Mr. De la Motte, the borough engineer and surveyor." It appears that no definite scheme has yet been framed, though a public appeal has been made to raise £500, but it is not without interest to note one proposal to put a floor or roof to the tower so as to provide shelter for trippers! Up to the present Conway Castle has been left alone by the restoration enthusiasts, and it is to be hoped that they will never carry out their present proposal.

The Gilt
Lettering
Epidemic.

No more completely wanton innovation has been made in our time than the epidemic of tawdry gilt lettering upon the street-fronts of London. The rapidity with which it has spread indicates the abject state of

public opinion upon architecture; twenty years ago a universal outcry would have been raised if anyone had dared to propose spoiling whole streets with this frippery; now nobody cares. The *carrefour* where Charing Cross and Tottenham Court Roads intersect Oxford Street is an extraordinary example of this mania, but its latest application is in quiet secluded old Grafton Street, Bond Street. There is no sense of proportion in the minds of those who employ it; the lettering is ugly, gigantic and absurd; very often it obscures windows; if there is a portion of the side wall visible it is there too; the name, whatever it may be, is repeated again and again until the front is covered. Standing out from the wall, it arrests and irritates the eye and prevents the architectural design from being grasped; it is plastered without pity upon

matter of fact, moreover, many of these things are not advertisements strictly so-called but names of institutions, offices, individuals, and, we are sorry to add, even churches. The main objection to the system is its want of all proportion; lettering of names, of titles of societies, companies, and the like, are not necessarily ugly, and if kept within reasonable limits may escape being offensive; gold too is pleasant to the eye in our climate, and a name or description lightly written in small flowing gold script upon a shop window is sometimes pretty enough. What is extraordinary in this matter is the ignorance displayed of the simple physical fact that smaller lettering, more concentrated, nearer the eye and alone, that is *not* repeated but standing out clearly upon a background of plain wall, catches the eye far more readily and is better



ROYAL SCHOOL OF ART NEEDLEWORK, IMPERIAL INSTITUTE ROAD, S.W.
FAIRFAX B. WADE, F.R.I.B.A., ARCHITECT.

every feature—in fact street architecture is looked upon mainly as a sort of convenient frame for this show of gilt gingerbread. The worst example is in Holborn, where a house has been rebuilt simply to display it. London enjoys an evil pre-eminence in this matter, for the provincial towns are still fairly free from it, but Paris is rapidly being spoilt; its strong, light and essentially tasteful iron balconies are obscured by it in every direction. Upon the heels of this innovation has followed another in the shape of immense fascias of dead blue and staring white lettering, and finally vast pictures; one of these rears its gawky head on the Surrey side of Westminster Bridge, an affront and an eyesore to all beholders. It is not open to the persons who are thus engaged in spoiling a great city to say that this is legitimate advertisement; many other channels are open by which traders can call public attention to their wares. As a

retained in the memory than the present alphabetical jumble. As now used, the spreading of the name to the whole width of a house, and its needless repetition, tire the eye and defeat their own object. The increasing practice of nearly obliterating the architectural character of a building by absurd and exaggerated lettering is, after all, only a sign of the complete indifference of the public to architectural taste; very few people care that glass shelters are built right across piers, arches and even doorways, often destroying a whole façade; or that posters, pictures and play-bills are growing in size and colour and repeated upon theatres to the point of disfigurement—the public are dead to all architectural argument. But the question arises whether among the liberties of Englishmen that of being allowed to torment the eye of every educated person and of defacing a great capital can reasonably be included.

RECENT STREET ARCHITECTURE IN LONDON.—IV.

BY F. HERBERT MANSFORD.

(Continued from p. 241, No. 382.)

THE last competition for the Soane Medallion showed what a swimming bath might become under favourable conditions. Now and again in our streets we see them as they really are. Generally speaking, the authorities purchase property with a small frontage, the baths proper have to be banished to the rear, and the façade acquires an expression which, at a little distance, would serve equally well for a police station or a public library. The Fulham Public

style are still possible in the heart of London. Considering that this is one of the most pleasing elevations in a long thoroughfare, it is almost ungracious to suggest that a sixteenth-century phase is inappropriate to-day, especially as all requirements of light and convenience would appear to have been met. The one modernism is entirely successful—the sign consists of six bell-shaped reflectors with incandescent electric light bulbs as pendula.

At the corner of Old Brompton Road and Redcliffe Gardens some acres of ground are being covered with shops and flats in red brickwork quietly treated in a somewhat Georgian manner from the designs of Mr. Paul Hoffmann.

The names of some thoroughfares, such as Gower Street, Adelaide Road and Collingham Gardens, inevitably recall to our minds distinct,

seems no reason why they should not do so more frequently.

Bold decorative heraldry forms an important adjunct to the main entrance of the new building of the Royal School of Art Needlework in Imperial Institute Road. The lion and unicorn lean rather uncomfortably forward in order to act as corbels to a group of triple niches above. Mr. Wade has boldly introduced twisted rococo columns on either side of the doorway—columns such as we are accustomed to see in staircase balustrades and other internal accessories, but very rarely used externally in this country. This is not meant as an argument against their employment, provided they appear beautiful and appropriate. Doubtless the architect is prepared for adverse criticism, for the columns are almost defiant in their relentless aspect, and more provoking than those of the upper stage which aroused Lord Wemyss's ire because they appeared to rest upon corbels. Perhaps the projection of these has been modified as a result of his robust criticism, for the corbels are very small indeed when carved. Most, however, are in block, as is the greater part of the carving at present, including the capitals of the columns in question. The edifice occupies an almost square site, with frontages to two wide roads. In elevation the basement consists mainly of semicircular arches of white stone, with bands and vousoirs of bluish grey. The principal floor is faced with thin red bricks relieved by stone dressings. The windows at this stage are of lofty proportions, and the wooden frames are divided into small squares. Above, the walling is entirely stone-faced and the windows open generally on to balconies between columns, appropriately perhaps, for Imperial and University functions may occasionally take place in that vicinity. The green-slatted roof is broken by frequent dormers of which the cheeks, gable fronts and roofs are also covered with slates, curving on to the main roof without the intervention of a leau gutter or visible lead dressings. The angle pavilions are covered with roofs square on plan, but of a depressed ogee outline which, however agreeable in elevation, appears distorted in perspective from certain points of view. There is a piquant charm about the building both as a whole and in detail that rivets the attention and challenges criticism, but we cannot enjoy it with an easy conscience. Its abandonment of precedent and principle would in the hands of a less able designer savour of degeneracy rather than of progress.

On the opposite side of Imperial Institute Road are rising the walls of the new Royal College of Science, which, judging by Mr. Aston Webb's Academy drawings, will prove a most dignified and tasteful addition to a notable group of buildings. Yet we cannot but view its erection with regret, owing to a fanciful dream that some day the Natural History Museum would be completed by the addition of a north front and the ground between that and the Imperial Institute laid out with trees and fountains to form a University square such as could not be matched in Europe.

No. 112, Sloane Street, affords an example of the way in which a plain brick house can be given a modern (one had almost written "fashionable") appearance by slight alterations to the windows, the addition of a few courses of ashlar and a well designed balcony. In this instance the masonry joints, vertical and horizontal, although rather fine, are deeply raked out, with the result that at close quarters the stones, more especially the vousoirs of the arch, appear to be loose. When raked-out joints are widely constructed the mortar convinces us of its presence.

This quarter of London was so largely rebuilt a few years ago that there are few changes to note beyond the completion of some solidly-constructed and attractive residences just south of Chelsea Square and some rows of houses nearer Chelsea Hospital.

At Millbank various blocks of dwellings have been erected by the London County Council on lines similar to those of the Boundary Street area at Bethnal Green. Good red-facing bricks relieved with cement panels or bands of purple brickwork, roofs of red tiles or green slates, and ample space between the blocks, go towards making the streets more attractive and far healthier than many occupied by self-styled "mansions." Hogarth Building, with its projecting wings, octagonal turrets and bold centre



PUBLIC BATHS AND WASHHOUSES, WALHAM GREEN, S.W. H. DIGHTON PEARSON, ARCHITECT.

Baths at Walham Green are not more fortunate than many others in this respect, but the architect, Mr. H. Dighton Pearson, A.R.I.B.A., has given, as outward symbols of their purpose, the aquatic deities of the second storey. It is at this level that the originality and strength of the whole design is most marked. One feels the entasis of the columns above and the rustication of those beneath to be somewhat excessive—a matter, perhaps, of individual taste.

In the King's Road, Chelsea, the "Six Bells" (see p. 31C) is an example of what can be done in one direction within the limits of the Metropolitan Building Act. Here we have timber-constructed bays supporting an overhanging upper storey in quite old English fashion. It will be noticed that the projections are obtained mainly by setting back the normal wall-face nearly 3ft.; the timber used is either oak or teak. In this manner, given a client generous of space and purse, such revivals of a charming

types of houses. Queen's Gate was formerly one of these, but now the buildings on its opposite sides are strikingly different. The terraces of houses on the west are stucco-fronted, but substantial, erections of forty years ago. But on the east we find the whole gamut of styles since in vogue, from the Gothic of Butterfield's church, the Flemish and Georgian moods of Mr. Shaw, and the Italianised mansions at the ends of the street, to the latest and styleless blocks of flats in the middle. The most pleasing of the quite recent elevations is surely that of the flats numbered 177. These are indeed superior to most of their class, the worst that can be said of them being that they might be mistaken for a private mansion, an impression that is strengthened by the pseudo-heraldic sculpture with supporters upon the colonnaded loggia of the first floor. Truly the aristocracy do not often place their coats-of-arms permanently upon their town houses, although there



CORBEL, QUEEN ANNE'S BOUNTY OFFICE,
GREAT SMITH STREET, WESTMINSTER.

gable, is the most picturesque but probably the most costly of these blocks. If these tenements meet the needs of a similar class to those who have occupied the model dwellings of twenty years ago, we can feel that a real advance has been made in this direction.

On the west side of the Tate Gallery new barracks have been erected to take the place of those adjoining the National Gallery. They consist of an administrative block, a married-quarters wing, an entrance lodge and some subsidiary buildings, all being arranged around a spacious drill-ground. They are of red brick and stone, and appear well adapted to their purpose, but afford externally no special points of architectural interest.

The Army and Navy Stores, Ltd., have erected various blocks to the south of Victoria Street, the most noticeable being that facing down Rochester Row and occupying, not unworthily, a fine site. The ground floor comprises a long series of cartways divided by sturdy Doric columns of unpolished granite which look quite equal to their function of bearing a many-storied warehouse. Just south of St. Stephen's

Church is a new police station with frontages to Rochester Row and Vincent Square, and here one feels the latter elevation has been somewhat neglected.

The site and neighbourhood of Emanuel Hospital is now covered with lofty blocks of flats amidst which the older ecclesiastical structures struggle for predominance in vain. When an entrance gateway assumes the proportions of a chancel arch, it is waste of money to build spires. Nothing quite so Brobdingnagian in detail as the Hotel Windsor has been repeated in Westminster of late, nor very little so good.* The architect of that building possessed a strength of touch not traceable in the "mansions" and "courts," with their finicking corbels and columns and turrets. The new schools of Christchurch, in Buckingham Gate, are conspicuous by their modesty. Attached as they are to the old Bluecoat School, their quiet wall-surfaces and refined details are doubly to be appreciated.

At the north end of Great Smith Street is a stone-faced Gothic building occupied by the Queen Anne's Bounty Office, and a little further on are additions to the Church House. Both these buildings are characterised by a certain hardness of detail, both appear to have been curtailed in outline by neighbouring rights of light, and the extension

of the Church House is neither pleasing in its proportions nor does it group happily with the Great Hall to which it is an adjunct. To the ordinary outsider the thought comes—if the Queen Anne's Bounty Commission had arranged to occupy a wing of the Church



ENTRANCE DOORWAY, NOS. 81-83, QUEEN'S GATE, WESTMINSTER, S.W.

House some worthier memorial of the late Queen's Jubilee might have been accomplished.

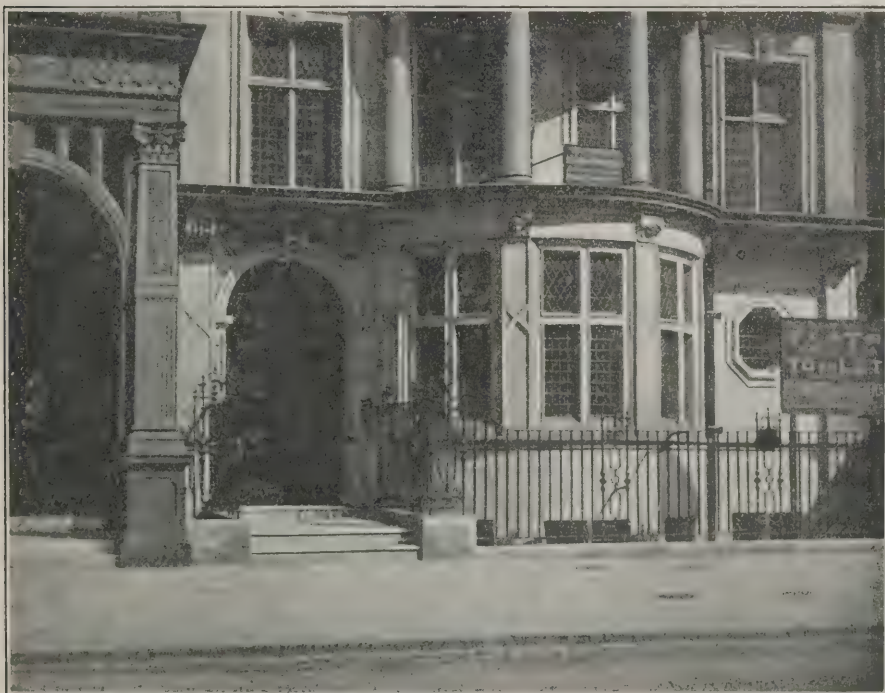
Opposite "Scotland Yard" a new divisional police station has been completed from the designs of Mr. Dixon Butler. The building harmonises with its famous neighbour, but lacks the breadth of treatment and masterly touch of Mr. Shaw's work, and, coming to details, one feels that the two chimneys on the east gable might well have risen from the projecting masonry of the principal floor, instead of being corbelled out but a little higher up. The improvement in the design of recent police stations over those of twenty or even twelve years ago is very marked.

(To be continued.)

The Scheme of Decoration for Westminster Bridge, Mr. Walter Crane points out, was originally planned by Professor Lanteri, Professor Moira co-operating. The work was carried out by students at the Royal College of Art, South Kensington, but the celluloid lamps attached to garlands were no part of the scheme, having been added by other persons.

"The House of the Seven Gables": A Problem for Architectural Students.—As already announced, we offer a volume of THE ARCHITECTURAL REVIEW for the most successful plan, with elevations or perspective, of the "House of the Seven Gables," to be sent in not later than July 21st. Full particulars are given on p. 290 of our issue for June 25th.

The Opening of the Roman Catholic Cathedral at Westminster, it was rumoured, would take place on Sunday last, and consequently the clergy at Archbishop's House were overwhelmed with applications for tickets. The rumour was, of course, without foundation. In a sense the building is "open" now—that is to say, the public are admitted to view the shell on payment of a nominal fee.



NO. 177, QUEEN'S GATE, WESTMINSTER, S.W.

TOWN SQUARES OF NORTH ITALY.

SEVEN centuries ago the characteristic which most distinguished Italy from other European countries was the growing importance of the populations of her towns. This came about in several different ways. Some cities managed to retain the privileges which had been granted them ages before by the Roman government, and to keep them more or less intact through all the vicissitudes of the Dark Ages. Others, like Venice and Genoa, had grown up in secluded localities where they escaped notice until they were strong enough to assert their power. In regions where the central government was unable to exert its functions these cities rapidly became strong and vigorous. Their citizens erected strong walls, and enacted their own laws

this right and from successive turmoils emerged the "commune," including the *popolo* of enfranchised burghers, and the non-qualified inhabitants, represented by consuls from the different quarters. The architecture of many of these towns where a "palazzo del popolo" and "palazzo comunale" rise in different streets perpetuates the strenuous political life of those stormy times. Besides these bodies there were the councils, known by different names in different cities, but perpetuating their history in the name of many a gorgeous hall and stately building—the Parlamento, open to all inhabitants; the Gran Consiglio, only open to the *popolo*; and the Credenza, or private council.

The Crusades, which brought only ruin and wounds to the northern nations, brought business, wealth and luxury to the rising commonwealths of the Adriatic. Italian ships sailed on every sea, and the palaces of the Italian nobility were

most picturesque of these old Italian town squares. Verona itself is a city of the most striking and varied physiognomy. It is divided into two parts by the turbid and swift-flowing Adige, which tears in a wide semicircle through the densely populated quarters, occasionally rising beyond its walls to leave unmistakable traces of its power in ruined bridges and crumbling houses, as well as certain significant water-marks on sundry buildings along its banks. The central part of the city is a delightful assemblage of softly-coloured red brick and plaster buildings on narrow and curving streets. Beyond these are the wide and straight thoroughfares lined with the productions of Sanmicheli, cold, stately, grammatical and formal. These too are often of brick, but conceal their true construction under a mask of yellow stucco. Beyond them again are the ramparts with their remarkable Renaissance portals, again the work of Sanmicheli, the foremost military engineer of his time, from the top of which the snowy range of the Venetian Alps lies in full view not many miles away, together with the neighbouring hillsides studded with walls and forts. For Verona is still a strong place, one of the most important bulwarks of power of modern Italy, and in her barracks an army of 6,000 soldiers is constantly maintained in readiness to protect the frontier.

The student who, after visiting Rome and Venice, starts on a tour among the north Italian towns, is apt to become somewhat indifferent to the often-repeated red brick palaces and churches which line the level streets of these cities of the plain. The details, while varying in different localities, yet have much the same general character, and after a few repetitions fail to excite as much interest as they deserve. But it is safe to say that the most *blasé* traveller will experience a new thrill when he emerges from the Via San Sebastiano into the little vegetable market, the Piazza dell' Erbe of Verona. At one end rises the white marble pillar bearing the lion of St. Mark, the ancient cognizance of the republic of Venice which the Venetians were wont to erect in the market places of their subjugated cities. Dark and weather-beaten buildings surround the square—the gloomy Municipio with its great brick tower, the Gothic houses of the merchants and the curious baroque Palazzo Maffei which closes up the end. In the shadow of these houses rise a graceful shrine in the Venetian style, a canopied tribune with four marble columns, the old seat of justice, and an elaborate fountain. More in evidence than all these are the chattering market women with their loads of produce, the dusty squads of soldiers, and the remarkable policemen with their long coats, tall hats and gold-headed canes. As a "town square" the Piazza dell' Erbe has an annex, the beautiful Piazza dei Signori, which is entered by a short passage. This is certainly the most dainty public square in all Italy. On one side is the charming Loggia with its delicately-coloured façade and tastefully-restored chambers. The woodwork of the ceilings both of the outer loggia and of the interior is remarkably interesting and typically Italian in detail as well as in colour.

Around the other sides of the place are the aged walls of the Mercato Vecchio and the Prefettura, and but a step removed are the famous tombs of the Scaligers, the renowned Ghibelline family who raised Verona to her greatest glory in the fourteenth century.

The stately tower of the Municipio, which, like the Torrazzo of Cremona, seems to personify the spirit of the city, rises above the roofs with its walls of time-stained brick and the scattered puttock holes which somehow give so much effect to Italian buildings and yet are so much avoided by modern architects. These spots of black give a piquancy and brilliancy to the mass of brickwork, like the quick black touches of pen or pencil in a spirited drawing. It would seem as though we in our decadent period might endure the sight of a quality in buildings which gave no offence to the eyes of the master-builders of the *quattro cento*.

The old brick walls of the Mercato Vecchio alluded to above enclose in the courtyard one of the finest and most picturesque of the exterior stairways of Italy. The steps are covered with a finely-proportioned ascending loggia, and the railings and balustrade are most charming in detail. The little shops which nestle under the



"THE SIX BELLS," KING'S ROAD, CHELSEA, S.W.

and elected their own magistrates in safety. In the darkness of the general situation these cities or burghs appear as the only luminous points. From their walls, which enclosed the houses grouped around their cathedral as a centre, the burghers looked out on a country studded with the keeps of the feudal aristocracy lording it over the unconsidered serfs.

In general the bishops commanded more popularity in the cities than the outside nobility or counts, and in many cases the counts were driven to their castles, surrounded by the *contadini* or "counts' men," while the clergy remained to organize the town government of the richest and most influential burghers, or *popolo*.

The *popolo*, it appears, did not include the entire people, but was a close aristocracy of influential families who succeeded to the authority of the superseded count and held it by hereditary right. In those tumultuous times the remaining citizens were inclined to challenge

gorgeous with the brilliant products of eastern art, while the castles of France and England were but little better than hovels. Italian factories arose on every hand, and banks and money-changers appeared in every city. Under these circumstances it is not strange that we find the sturdy municipalities of north Italy rivalling each other in erecting the beautiful series of town-halls which still stand second only to the churches in architectural interest. The ground floors were often open, forming a loggia, under whose massive arches the citizens might stand sheltered from the weather and discuss the affairs of their city. Of this class were the buildings at Piacenza and Cremona. Grouped around the town squares, which were often outgrown by the increasing size of the city, stood the palaces of the municipality, the cathedral, the houses of the guilds and the dark-fronted dwellings of the powerful town nobles.

The Piazza dell' Erbe at Verona is one of the



HOGARTH BUILDING, MILLBANK, S.W.

arches complete the air of abandon which is so fascinating to Western eyes and which with the rapid progress of restorations is fast departing from the ancient buildings of Europe.

The finest church architecturally in Verona is Santa Anastasia, a splendidly-proportioned red brick building of the thirteenth century, whose fine tower rises nobly above the rapid waters of the Adige. The group of chapels, transepts and gables crowned by the majestic campanile forms one of the most striking ensembles ever carried out in brick; and the details of the pilasters and cornices are equally worthy of study. Fine as is the exterior of Santa Anastasia, the interior is even better, and it is safe to say that a more complete or beautiful composition in the Italian Gothic style does not exist. Not only is the plan beautifully proportioned, but the entire scheme of colour decoration is carried out consistently and completely. The decorations of the vaulting in the late Gothic style, dating from 1437, are particularly worthy of notice of the student of decoration. The church contains a large number of works of art and is full of interest in every corner. The great west door, for example, is a particularly attractive example of early carpentry work, with numerous small square panels and carved edges.

The river, which flows just behind the church, is one of the most picturesque features of Verona. Wide and strong, it courses foaming through the town incidentally turning the wheels of a number of floating water-mills which tug strenuously at their moorings and threaten momentarily to start down the stream. The newer bridges of the Adige show many marks of the violence of the stream in time of flood, but the old red brick Ponte del Castel Vecchio, one arch of which spans 160ft., at the upper end of the town, still stands after six centuries as firm as ever and makes, with its Ghibelline parapets and grim brick castle, a splendid bit of colour above the curving river. The old castle,

the abode of Can Grande II., the greatest of the Scaligeri, from which the bridge leads to the opposite shore, is in itself one of the curiosities of Verona, but one which the public are not allowed to examine.

Beyond the Castel Vecchio you follow the embankment of the river for some distance, while the houses grow thinner, until, turning through a short street, past gardens and orchards, you emerge on the sleepy and grass-grown Piazza San Zeno, a spot the most typical of old Italy that is to be found in the entire peninsula. The quaint yellow marble façade of the church, richly stained by time, with its grotesque carved animals and figures, is balanced by a sturdy square brick tower with forked parapets and massive walls. The brick tower, which has no particular architectural features, finds its special value in the colour contrast of its glowing red surface with the soft yellow of the church façade, completing a most picturesque and striking composition, which without it would be almost commonplace, as may be seen by covering it for the moment with the hand.

Allusion was made just above to the bridge of the Castel Vecchio. The brick bridges of Italy might form the subject for a study which would reveal a mine of unworked material for the use of our latter-day practitioners in municipal art. There is one at the entrance of the old town of Pavia, not far from Verona, which seems almost the ideal of what a bridge ought to be. The simple, powerful arches stride nonchalantly across the waters of the Ticino, carrying the delightfully quaint roof and bearing on their central pier the brick chapel which gives the central point of dignity and repose to the composition. The mediæval bridges, like those of Pavia and Verona and that of Montauban in France, seem to convey a most satisfying impression of quiet strength and suitability, forming a happy mean between the airy grace of the bridges of modern Paris and the sullen inertia of the structures of ancient Rome.

Correspondence.

Architectural Shams.

To the Editor of THE BUILDERS' JOURNAL.

39, ONSLOW ROAD, RICHMOND HILL, SURREY.

SIR,—I should feel greatly obliged if any reader would kindly inform me of any architectural shams there may be in his locality; such, for example, as the dummy gate-lodge with painted windows at the Richmond Gate entrance to the Park here, or the imitation ruin that helps to disfigure Eel Pie Island. I am already acquainted with many shams of this kind in various parts of the country, but there must be numerous others equally bad, though less popularly known, and it is with the object of learning something of these that I make the above request. I may say that I desire the information for certain literary purposes.—Yours truly,

G. I. L. BRAY.

Leigh Infirmary Competition.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, E.C.

SIR,—I submitted a set of drawings in the recent competition for an infirmary at Leigh, Lancashire. I forwarded the nominal sum of 5s. for particulars and plan of site. At the close of the competition I was informed by the hon. secretary of the Infirmary Committee that the 5s. was in payment for the conditions and that the money was retained on the advice of the assessor (who, by the way, is the hon. secretary of the R.I.B.A.). Surely this is an unusual proceeding on the part of an assessor appointed by the Institute and a travesty of the suggestions issued by them for the conduct of architectural competitions.—Yours truly,

ASSOCIATE.

Law Cases.

Handsworth Building By-Laws: A Series of Prosecutions.—At the Handsworth Police Court recently several cases brought by the urban district council against local builders for contravening the by-laws were heard. A builder and contractor named Evan Thomas was fined £5 and 10s. costs for not depositing a plan of some stables which he had erected. He was also fined £3 and costs for erecting a shed with walls of wood and a corrugated iron roof instead of "brick, stone or other hard incombustible substances." John Davies was summoned for erecting a building not in accordance with plans deposited: this summons was dismissed, but a fine of £3 and costs was inflicted for not "properly bonding and solidly putting together every brick wall with good mortar or cement" as required by the by-laws. S. J. Davies was fined £3 and 8s. 6d. costs for building a bedroom wall over a kitchen 4½ in. thick instead of 9 in. H. Roberts was fined £3 and £1 11s. 6d. costs (including analyst's fee) for using bad mortar in eleven houses on the Farcroft estate: the building inspector stated that the mortar "consisted largely of garden soil." G. Gee was fined £5 and 8s. 6d. costs for not depositing plans and using materials other than those stipulated in the by-laws.

Right to Drain into Sewers.—The case of *The London County Council v. The Acton Urban District Council* recently came before the Court of Appeal. The plaintiffs claimed from the defendants £225 9s. 5d. and interest, pursuant to the London County Council (Acton Sewage) Act, 1898, for the use of the metropolitan main drainage system. The defence was that the plaintiffs were only entitled to recover

£97 16s. 6d., which sum the defendants paid into court. The point in dispute was as to the number of houses which had obtained a prescriptive right to drain into the Stamford Brook sewers, one of which passed along the boundary between the plaintiff's district and the County of London, while the other passed through the defendant's district into the County of London. The plaintiffs assumed that all houses or build-

ings connected with the Stamford Brook sewers before January 1st, 1856—when the Metropolitan Management Act came into force—and no others had acquired a prescriptive right to drain into the sewers in question. The defendants contended that all houses and buildings which had drains connected with the Stamford Brook sewers, and had used them for the legal period of prescription on July 25th, 1898, when the London County Council (Acton Sewage) Act was passed, had acquired a prescriptive right to drain into the Stamford Brook sewers within the meaning of section 3 (1) (a) of the Act, and ought to be excluded in estimating the ratable value of the property assessable. Mr. Justice Ridley gave judgment in favour of the plaintiffs. The defendants appealed. The Master of the Rolls said that in his opinion the words "other than houses or buildings having acquired a prescriptive right to drain into the Stamford Brook sewers" had reference to a true prescriptive right in the legal sense, and were not applicable to a mere user for twenty years apart from any legal right. It seemed to him to be obvious that the intention of the Legislature was to safeguard rights which already existed, and that the exclusion was meant to cover only those houses possessing then rights of drainage, for which it would not be fair that any further payment should be demanded. He therefore thought the judgment of Mr. Justice Ridley should be affirmed.



ELECTRICAL GENERATING-STATION AND LAUNDRY FROM THE RIVER SEVERN. GEORGE HORNBLLOWER, F.R.I.B.A., ARCHITECT.



ROYAL WELSH WAREHOUSE AND FACTORY, NEWTOWN.

ROYAL WELSH WAREHOUSE AND FACTORY.

THE accompanying illustrations show the more important of the buildings erected during recent years for Messrs. Pryce Jones, Ltd., of Newtown, to meet the growing requirements of their business. The first section of the Royal Welsh Warehouse was built in 1879, the late Mr. David Walker being the architect. This building has now been more than doubled



DOORWAY OF WAREHOUSE.

in size by the extension approaching completion. Mr. George Hornblower, F.R.I.B.A., of London, is the architect, and Messrs. Edward Davies & Son, of Newtown, are the builders. The same architect and builders were responsible for the new factory, built in 1895, and for the electric generating station opened last year, and also for the laundry buildings completed last year. The bridge shown as connecting the factory with the extensions of the warehouse is from the designs of the architect, and the tender of Messrs. Dorman, Long & Co., Ltd., has been accepted for the structural steelwork. Messrs. Rubery & Co. supplied the steel stanchions and girders for the laundry, and Messrs. Dorman,

Long & Co. those for the factory and warehouse. Best pressed red bricks are used throughout the buildings, the whole of the brickwork being in Portland cement. All the cornices, sills, copings, &c., throughout are in Grinshill stone, as is also the carving. Mr. W. Roberts, of Welshpool, has executed the whole of the mason's work throughout the buildings. Glazed brick facings are largely used internally, and the doors and much of the joiner's work are in oak. Messrs. Burstall & Monkhouse supervised the electrical installation; Messrs. Davey, Paxman & Co. supplying the boilers, &c. A section of the ground floor of the warehouse extension has been leased to the Government as a post-office by special arrangement, for the convenience of Messrs. Pryce Jones in connection with their immense country and foreign trade.

THE BIRKBECK BANK.

THE new buildings of the Birkbeck Bank are now almost completed. The portion extending along Southampton Buildings to the back of Staple Inn is even more elaborately treated than the Holborn front. The architect is Mr. T. E. Knightley, F.R.I.B.A., of Messrs. Knightley & Battisbury, Cannon Street, who also designed the Queen's Hall. The buildings cover about an acre of ground—the freehold of the bank—and a new road has been constructed on the eastern side, called, rather cumbrously, Staple Inn Buildings Road. The lie of the land on the south side presented a rather difficult problem, as it necessitated an obtuse angle between the eastern and the southern lines of the building. There is no waste of space; the numerous corridors are all well-lighted and the rooms on the various floors are provided with reflectors of varying dimensions, so that the upper ones do not in any appreciable degree obstruct the direct rays of the sun from those of the lower rooms. Even in the basement there is a much better access of light than is to be found, for example in chambers similarly placed in Lincoln's Inn. There are four staircases, easy to mount, from several points of which one can look from the ground floor to the roof, spacious landings and no divisions separating one part of the building from the rest, although, as means of safety against fire, isolation is made easy by a number of iron doors. A very large number of offices and shops are provided.

The bank itself is a circular-domed room considerably larger than the main room in the Bank of England. Its diameter is 72ft. and its height about the same. Outside the counters is a space 10ft. wide, floored with indiarubber to



MAIN ENTRANCE TO FACTORY.

prevent resonance, and seats and tables for customers. There are also a writing-room, a waiting-hall and a room for opening new accounts; the board-room is an exceedingly elaborate apartment. Around the dome is a gallery in which the Land Building Societies' business is carried on. Beneath the floor and extending over the ample strong-room below are semicircular iron arches, not quite reaching the sides, so as to obviate any thrust of the arches. There are many strong-rooms and safes provided for customers and others who may wish to rent them from the bank. There is a fine well, of which the water has been analysed by Professor Attwood and pronounced to be pure and soft. Plenty of lifts are provided, and the electricity for lighting purposes is produced on the premises. The heating of the corridors is



ADDITIONS TO ROYAL WELSH WAREHOUSE AND CORNER OF FACTORY, SHEWING COMMUNICATING BRIDGE.
GEORGE HORNBLOWER, F.R.I.B.A., ARCHITECT.

by steam radiators, the heating and ventilation being by Blackman. Internally and externally the walls are faced with imperishable salt-glazed terra-cotta in colours approved by Sir William Richmond and readily cleaned. In respect of decoration there are outside on the east and south busts of distinguished men—some of whom, like William Hazlitt, who lived on the spot, bring local associations. Around the dome are sixteen compartments of fresco, each containing a subject suggestive of the business of banking, or, as in the case of the figure of the lamented manager, Mr. Ravenscroft, with a dog representing fidelity and an eagle representing foresight, at his feet, and of the picture representing the run on the bank ten years ago, suggestive of the bank's history. The contractor is Mr. Charles Wall; the terra-cotta work is by Messrs. Doulton, and a portion of the tiling by Messrs. Boote & Co.

Bricks and Mortar.

APHORISM FOR THE WEEK.

*They builded a tower to shiver the sky and wrench the stars apart,
Till the Devil grunted behind the bricks: "It's striking, but is it art?"
The stone was dropped by the quarrieside, and the idle derrick swung,
While each man talked of the aims of art, and each in an alien tongue.*

—KIPLING

("The Conundrum of the Workshops").

Our Plates. THE design for a small private school was submitted in competition for the A.A. Medal. Accommodation is provided for sixteen boarders and thirty-four day scholars, with a master's house. Cross-ventilated dormitories are arranged on the first floor.—The villas at Harpenden are built of red bricks up to the level of the string, and above this of rough-cast and half-timbered work. The roofs are covered with red tiles. The architect is Mr. J. Percy Hall, A.R.I.B.A., of 6, Victoria Grove, Kensington, W.

Birmingham University Buildings. THE first contract for the erection of the new University buildings in the Edgbaston Park Road has been secured by a local firm. Messrs. Smith & Pitts, of Moseley Road, have received a letter from Messrs. Aston Webb & E. Ingress Bell, architects, of Westminster, informing them that their tender for the power station and fitting shop has been accepted. The letter also states that the question of the acceptance of a tender for the

foundations of the University buildings is still under the consideration of the Council. The whole of the work, when completed, will amount to something like a quarter of a million. The work is to be executed in sections, and the present plans provide for five sections out of a probable total of a dozen. The contract secured by Messrs. Smith & Pitts is for the first of these blocks.

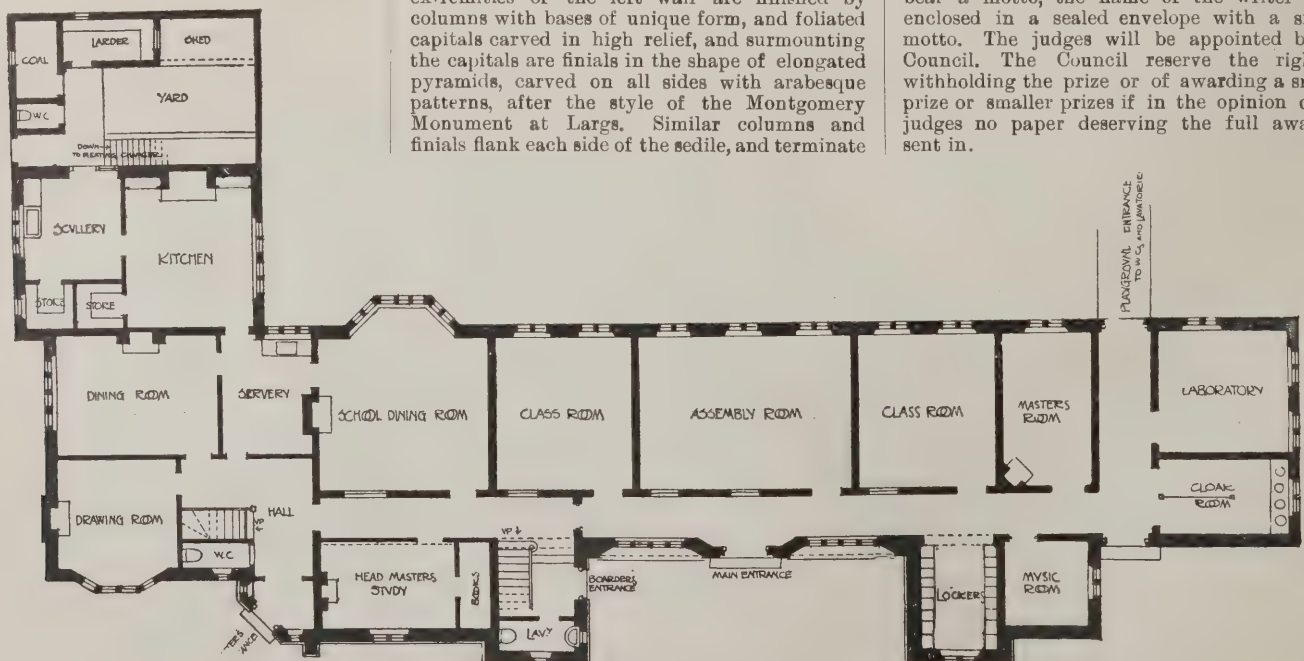
A Discovery at Dublin Cathedral. DURING the progress of the present restoration of St. Patrick's Cathedral, Dublin, a remarkable discovery was made, that underneath plaster of the time of William and Mary real and beautiful thirteenth-century stonework had lain hidden for generations. Not only Ireland but all lovers of archaeology and ecclesiastical monuments owe a debt of gratitude to Lord Iveagh, whose timely generosity has arrested the decay that threatened to bring the cathedral tottering to its fall, a decay largely due to a fatal mistake in the restorations of 1845, when soft stone from Normandy was employed instead of the durable Somerset or Portland stone, capable of withstanding the vagaries of the Irish climate for seven centuries. Besides the gift of the new organ, Lord Iveagh has caused it to be moved from the north transept to a fine organ-chamber reached by a beautiful spiral staircase of stone, copied from one in Mayence Cathedral. Two flying buttresses outside complete the work, and are in perfect harmony with the beautiful thirteenth-century character of the whole.

A Novel Family Monument. ADJOINING Fyvie Church there has just been erected a monumental structure which will enclose the burial-place of the family of Mr. Forbes-Leith, of Fyvie. The work was entrusted to Messrs. A. Macdonald & Co., Ltd., Aberdeen Granite Works. The structure consists of three sections forming a semi-hexagon, adjoining the church, and abutting on the wall of the churchyard at one side. It differs from the ordinary mausoleum in being an open structure without a roof, the floor being formed into paths, flower beds and gravelled spaces. Looking towards the end of the enclosure, the wall on the left contains three square panels filled with inscriptions; the end is in the form of a sedile or seat elaborately carved; while the wall on the right, which is the longest of the three, contains six panels, two of which will eventually be inscribed. Granite of a rich red tint is the material used throughout. Mr. Forbes-Leith secured details from various historical buildings in Scotland and elsewhere, and these have been incorporated. The main structure of the walls is of large finely-dressed blocks, carefully jointed, and surmounted by a cornice with moulded dentils and a broad frieze, which carries an inscription in letters about 6in. in length. The extremities of the left wall are finished by columns with bases of unique form, and foliated capitals carved in high relief, and surmounting the capitals are finials in the shape of elongated pyramids, carved on all sides with arabesque patterns, after the style of the Montgomery Monument at Largs. Similar columns and finials flank each side of the sedile, and terminate

the wall on the right, there being four in all, but the sedile capitals are of more ornate design. The sedile has an elliptical-arched canopy with panelled spandrels, the superstructure consisting of a panel in which is carved the family coat-of-arms, supported by carved scrolls, above the panel being a scrolled pediment enriched with the Scottish taste in high relief, the whole being crowned by the finials already referred to. Within the enclosure is set up a Celtic monument in Kemnay granite—a copy of the famous Inveraray Cross.

Discoveries in Palestine. THE annual meeting of the Palestine Exploration Fund was held recently. Sir Charles Wilson delivered an address upon recent researches in the low-lying country of Judah, in which district the site of ancient Gath had been located. Upon a point which afforded a striking view of the battlefield upon which David slew Goliath remnants of pottery had been found, and among the discoveries in this district was a monolith which evidently formed one of the "high-places" often referred to in the Old Testament. Remarkable caves were also found, which at some period between 1200 and 1500 B.C. were inhabited, and there was archaeological evidence that cremation was practised by the cave dwellers. The pottery, which was clearly of pre-Israelite origin, was similar to specimens unearthed by Professor Flinders Petrie in Egypt, and believed by him to have been introduced by an immigration before the first dynasty. It bore strong indications of Mycenaean and Phoenician influence, and approximated very nearly to pottery found in the Hittite capital in Asia Minor. The observations made near the Dead Sea, showed that there had been a fall in the level of the sea after a fall lasting for a very long time. It was hoped that further researches would discover the layer of burned coal and ashes which marked the destruction of the town of Gezer by Pharaoh, the father-in-law of King Solomon, who afterwards gave the site to his daughter. Similar layers, very well marked, had already been found in Palestine, and they had been of the greatest use in dating finds of pottery and other remains.

A Prize Essay on Fire Protection. THE Council of the Society of Arts offer the Fothergill prize of £50 and a silver medal for a paper on "Existing Laws, By-Laws and Regulations relating to Protection from Fire, with Criticisms and Suggestions." The paper should consist of about eight to ten thousand words, and be written with a view to its being read and discussed at an ordinary meeting of the Society. Papers submitted for the prize must be sent to the secretary on or before October 1st, 1902. Each paper must be typewritten and bear a motto, the name of the writer being enclosed in a sealed envelope with a similar motto. The judges will be appointed by the Council. The Council reserve the right of withholding the prize or of awarding a smaller prize or smaller prizes if in the opinion of the judges no paper deserving the full award is sent in.



A PRIVATE SCHOOL FOR FIFTY BOYS: GROUND PLAN. A. A. CARDER, ARCHITECT.

Engineering Notes.

The Additions to the Borough Hospital, Eastbourne, are being supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent Manchester stoves with ornamental tiled sides and descending smoke flues.

Electric Light at Taunton.—Important extensions to the Corporation's electric light works have been made. Taunton was the first town in the United Kingdom to adopt a system of public lighting by electricity. The works have now been brought thoroughly up to date at a cost of £18,000, and the capacity of the station is 1,600 h.p.

Embankment Tramway Rejected.—In the House of Lords last week, on the motion of Lord Newton, an instruction to the Committee was passed that clause 5 of the L.C.C. (Subways and Tramways) Bill be struck out. This clause refers to the proposed tramway along the Embankment from Westminster Bridge to Waterloo Bridge, where it would connect with the shallow tramway to be formed from Theobald's Road, and under the new street from Holborn to the Strand.

Engineering at Liverpool University.—The annual prize distribution to students of the Walker Engineering Laboratories, University College, Liverpool, and opening of a new annexe to the laboratories, took place recently. The new annexe consists of a room which will be used for moulding, casting and forging. Forges, moulding bench and other equipment have been provided. A new research-room has also been added. The year just closed has witnessed a further growth of the engineering school. The total number of registered day engineering students during the year had been 131, that of the previous year being 107.

The Stair Tractor.—The lift is to be found in most large buildings, and a movable staircase has already made its appearance. It has, however, fallen to Mr. Louis Brennan, well-known in connection with the manufacture of torpedos, to strike the happy medium. Mr. Brennan has invented a special kind of stair-lift to which a handle is attached. To ascend the stairs the handle is grasped, and a button at its base pressed with the thumb; the handle at once proceeds upwards parallel to the hand-rail, giving a very appreciable help in making the ascent. According to the degree of pressure brought to bear by the thumb on the button of the handle, so the pace of the ascent is regulated. On being released the handle returns of its own accord to the foot of the stairs. As an assistance in carrying weights up a long flight of stairs the invention is also most valuable. The tractor is worked by pneumatic power generated by a small electric, gas, hot-air or oil engine, or from the mains; or, if preferred, a half-an-hour's hand-pumping will store enough force for a day's use. There is nothing to get out of order in the appliance and no danger. The progress is arrested as soon as the pressure of the thumb is removed, the handle remains where it was, and by a special contrivance of a most ingenious character it can withstand any strain on it. The address of Mr. Brennan is Woodlands, Gillingham, New Brompton, Chatham.

The Iron and Steel Institute will hold its autumn meeting at Düsseldorf on Wednesday and Thursday, September 3rd and 4th, 1902. Mr. E. Schroeder, general secretary of the Society of German Ironmasters, has consented to act as hon. local secretary, and an influential reception committee has been formed. The directors of the Norddeutscher Lloyd have generously offered to the members attending the meeting complimentary first-class passages, including table, to the number of 250, by the s.s. "Kronprinz Wilhelm" (15,000 tons, 35,000 I.H.P.) upon that ship's homeward voyage (from New York) to Bremen on September 1st from Plymouth. The provisional programme of the meeting is as follows:—On Tuesday, September 2nd, the members will arrive at Düsseldorf. On Wednesday, September 3rd, the president, council and members will be received by the civic authorities and by the reception committee in the Municipal Concert Hall (Städtische

Tonhalle). A selection of papers will subsequently be read and discussed. In the afternoon a visit will be paid to the Düsseldorf Exhibition, where groups will be formed under the guidance of English-speaking experts for the purpose of examining the various sections of mining, metallurgy and machinery. In the evening the Mayor and Corporation of Düsseldorf hold a conversation and concert. On Thursday, September 4th, the morning will be devoted to the reading and discussion of papers, and the afternoon to visits to the exhibition and to works in the immediate vicinity. In the evening the reception committee and the ladies' committee will be entertained at a banquet. On Friday, September 5th, the whole day will be devoted to visits to works. Five groups will probably be formed, proceeding respectively to Essen (the Krupp establishment), Dortmund (the "Union" Company, the Hoerde Works, the Hösch Steel-works), Ruhrort (the Phoenix Works, the "Rheinische Stahlwerke"), Oberhausen (the Gutehoffnungshütte), Duisburg (the Vulcan Works, the Duisburger Maschinenbau Aktien-Gesellschaft, formerly Bechem & Kretman). In the evening the exhibition grounds will be specially illuminated in honour of the institute. On Saturday, September 6th, there will be an excursion to the picturesque district of Vohwinkel, to the Elberfeld suspended railway, and to the Kaiserbridge near Müngsten. The party will return to Düsseldorf by 4 p.m. In addition to the visits and excursions mentioned, a limited number of members will leave Düsseldorf on Friday evening to visit the Peine and Ilse works, and a similar party to visit works in the Saar district.

BUILDING NOTES AND MEMORANDA.—IV.

By T. E. COLEMAN, F.S.I.

(Continued from p. 304, No. 385.)

Plasterer.

100 yds. super. of rendering = 28 bushels of chalk lime, 40 bushels of sand and 2 bushels of hair = 1½ yds. of lime, 2 cubic yds. of sand and 28 lb. of hair approximately.

100 yds. super. of render and set = 36 bushels of chalk lime, 40 bushels of sand and 2 bushels of hair = 2½ yds. of lime, 2 cub. yds. of sand and 28 lbs. of hair.

100 yds. super. of render, float and set = 60 bushels of chalk lime, 80 bushels of sand and 4 bushels of hair = 3½ yds. of lime, 4 cub. yds. of sand and 56 lbs. of hair.

100 yds. super. of lath, plaster and set = 20 bundles of laths, 9,000 nails, 36 bushels of chalk lime, 45 bushels of sand and 3 bushels of hair.

1 bundle of laths and 450 nails = 5 yds. super. of lathing approximately.

1 bushel of Portland cement = 2½ yds. super. of ¼ in. rendering = 2 yds. super. of ½ in. rendering = 1½ yds. super. of lin. rendering.

1 bushel cement and 1 bushel sand = 4½ yds. super. of ¼ in. rendering = 3½ yds. super. of ½ in. rendering = 2½ yds. super. of lin. rendering.

1 bushel cement and 2 bushels sand = 6½ yds. super. of ¼ in. rendering = 4½ yds. super. of ½ in. rendering = 3½ yds. super. of lin. rendering.

100 yds. super. of limewhiting = 1 bushel of chalk lime for one-coat work = 1½ bushels of lime for two-coat work.

100 yds. super. of whitening = 12 lbs. whitening, ½ lb. blue black and 2 gals. of size.

1 gal. of size = 1 lb. of glue and 1 gal. of water.

1 bundle of laths = 500 ft. run nominal = 360 to 400 ft. actual = 100 laths 4 ft. long = 110 laths 3 ft. 6 in. long = 120 laths 3 ft. long.

Single laths = ½ in. to ¾ in. thick and about lin. wide.

Lath and half = ¾ in. thick and about lin. wide.

Double laths = ¾ in. thick and about lin. wide.

1 bushel of hair = 14 lbs. approximately.

1 cub. ft. of hair = 11 lbs. approximately.

Plumber.

Milled sheet-lead is rolled in sheets about 30 ft. long and from 6 ft. to 7 ft. wide. It may be

obtained of any weight varying from 2 lbs. to 20 lbs. per ft. super. For aprons, flashings, &c., 5 lbs. lead is generally used; hips and ridges, 6 lbs. lead; roofs, flats, gutters, and cisterns, 7 lbs. lead; soil pipes, 8 lbs. thickness of lead.

Drawn lead pipes may be obtained in various thicknesses, the weight or thickness of any particular section being stated in lbs. per yd. run of pipe. Lead pipes ¼ in., ½ in., ¾ in., 1 in., 1½ in., and 2 in. diameter are manufactured in coils of 20 yds. or in lengths of 5 yds.

Pipes 1½ in., 1 in., 1½ in. and 2 in. diameter are made in coils of 12 yds. or in lengths of 4 yds. whilst 2½ in., 3 in., 3½ in., 4 in., 4½ in., 5 in. and 6 in. diameter pipes are sold in 10 ft. lengths.

Weight and Thickness of Milled Sheet-Lead.

Weight per ft. super. lbs.	Thickness. inches.	Approximate thickness. inches.
1	.017	—
2	.034	—
3	.051	1/30
4	.068	1/25
5	.085	—
6	.101	1/20
7	.118	1/15
8	.135	1/12
9	.152	—
10	.169	1/10

WEIGHT OF LEAD SERVICE-PIPES.

Diameter.	Light or common quality.		Middling quality.		Strong quality.	
	Thickness.	Weight per ft. run.	Thickness.	Weight per ft. run.	Thickness.	Weight per ft. run.
inches.	inches.	lbs.	inches.	lbs.	inches.	lbs.
½	.11	1.07	.14	1.34	.19	2.00
¾	.12	1.50	.15	2.00	.20	3.00
1	.13	2.25	.16	3.00	.21	4.00
1½	.14	3.00	.18	4.00	.23	5.34
2	.15	4.00	.19	5.34	.22	6.00
2½	.16	5.00	.20	6.66	.23	8.00
3	.17	6.00	.20	8.66	.24	11.00

WEIGHT OF DRAWN LEAD SOIL- AND VENTILATING-PIPES PER 10 FT. LENGTH.

Internal diameter of pipe.	Weight per 10 ft. length.		
	7 lb. thickness or .11 in.	8 lb. thickness or .13 in.	10 lb. thickness or .16 in.
inches.	lbs.	lbs.	lbs.
2½	48	55	—
3	57	66	—
3½	67	76	97
4	76	87	110
4½	85	97	122
5	94	107	136
6	112	128	164

Glazier.

For ordinary glazing purposes the description of glass known as *sheet-glass* is in general use. At one time *crown-glass* was largely used, but it is now superseded by *sheet-glass*. The average size of ordinary "sheet"-glass as manufactured is about 4 ft. 2 in. by 3 ft., whilst "crown"-glass is blown into circular tables or discs from 4 ft. to 5 ft. in diameter.

Crown-glass is manufactured in two thicknesses, known respectively as *usual thickness* and *extra thickness*. Each description is graded into four glazing qualities—best, seconds, thirds, and fourths or coarse. Superior qualities, known as A and B picture qualities, may also be obtained. "Usual" crown-glass is about 1/16 in. thick and weighs about 10 oz. per ft. super.; "extra" crown-glass averages 1/8 in. thick and 16 oz. per ft. super.

British sheet-glass as generally used for glazing may be obtained in six different thicknesses or weights, namely, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz. and 42 oz. per ft. super.; but the two latter are not in much request, as plate-glass is generally specified when thick glass is required. Each thickness or weight of glass is graded into best, seconds, thirds and fourths glazing qualities. The glass is sold in crates containing sheets of assorted average sizes and superficial contents, and the price per super. ft. varies according to the weight, quality

and superficial area of the sheets. Sheet-glass may be obtained up to the following extreme widths and lengths at an extra charge, but these limits of length and width cannot be combined in the same sheet:—

Thickness.	Extreme length.	Extreme width.	Extreme area.
ozs.	inches.	inches.	ft. super.
15	60	40	15
21	90	50	26
26	90	50	25
32	85	50	21
36	70	44	17
42	70	44	15

The extreme area mentioned, taken in connection with the extreme length or width required in any particular case, will indicate approximately the corresponding limit of width or length.

Foreign sheet-glass is sold in five glazing qualities, viz., best, seconds, thirds, fourths and coarse. The various thicknesses or weights obtainable are 15oz., 21oz., 26oz., 28oz. and 32oz. per ft. super. The average stock size of foreign sheet-glass is about 4ft. 6in. by 3ft.

British polished plate-glass is sold in three qualities, viz.:—ordinary, best and silvering. The ordinary stock description is $\frac{1}{16}$ in. thick, but it may also be obtained in $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$ and 1 in. thickness if specially ordered. Extra rates are also charged for $\frac{1}{16}$ in. plates over 100ft. super.

1 crate of crown glass = 18 tables of "usual" thickness and averaging 4ft. 6in. diameter = 36 slabs of "usual" thickness = 12 tables of "extra" thickness and averaging 4ft. 4in. diameter = 24 slabs of "extra" thickness.

1 crate of British sheet-glass = 40 sheets of 15oz. glass (average stock sizes) = 34 sheets of 21oz. glass = 28 sheets of 26oz. glass.

1 case of foreign sheet-glass = 300 ft. super. of 15oz. thirds, fourths, or coarse quality glass = 200ft. super. of all other qualities and weights.

Average Thickness and Weight of Sheet-glass.

Weight. per ft. super.	Thickness. inches.
oz.	
15	$\frac{1}{16}$
21	$\frac{1}{10}$
26	$\frac{1}{8}$
32	$\frac{1}{7}$
36	$\frac{1}{6}$
42	$\frac{1}{5}$

Painter.

For outside work boiled linseed oil should be used for mixing with paint, raw linseed oil being only suitable for internal painting.

Stopping woodwork in ordinary plain painting requires about 1lb of putty for every 20yds. super.

1 pint of knotting varnish = allowance for 100yds. super. of plain painting.

1lb. of paint = 3yds. super. of painting on brickwork or stone = 5 yds. super. on woodwork = 6 yds. super. on ironwork (approximately).

1 gallon of ordinary paint = 18lbs. to 24lbs. weight = 3 pints of linseed oil, $\frac{1}{2}$ pint turpentine, $\frac{1}{4}$ lbs. driers, 12lbs. to 17lbs. white lead in oil and $\frac{1}{4}$ lb. of dry colour (approximately.) *Note.*—Ordinary paints are made with white lead as a base, but for pure and brilliant greens, reds, blues, &c., various other metallic oxides or sulphides are used.

1 gallon of priming coat = 45yds. super. of plain painting on brick or stone = 80yds. super. on woodwork = 95yds. super. on ironwork.

1 gallon of red or dark paint = 70yds. super. of plain painting on brick or stone = 100yds. super. on woodwork = 120yds. super. on ironwork.

1 gallon of white or light paint = 65yds. super. of plain painting on brick or stone = 95yds. super. on woodwork = 110yds. super. on ironwork.

100yds. super. of 4-coat work (average) = 5lbs. white lead in oil, 2 galls. of linseed oil, 3 pints turpentine, 1lb. driers, 1lb. of dry colour, 5lbs. of putty, 1 pint of knotting, $\frac{1}{2}$ lb. pumice stone and $\frac{1}{4}$ quire of glass-paper.

1 gallon of varnish = 100yds. super. of plain varnishing approximately.

1 gallon of tar = 20yds. super. tarring first coat = 25yds. super. tarring second coat.

Paper-hanger.

Wallpaper is sold by the "piece" or roll. One piece of English-made wallpaper will cover a nett area of 6 super. yds. of wall-surface, after allowing for irregular cuttings and waste, whilst a piece of French-made wallpaper covers a nett wall area of about 4yds. super. In computing the number of pieces required to paper a room (including allowance for waste) divide the total super. ft. of wall-surface by 54, and the result will give the number of pieces of English-made paper required. For French wallpapers divide by 35 to ascertain the number of pieces required.

1 piece (English) = 12yds. run and 21in. wide = 7yds. super.

1 piece (French) = 9yds. run and 18in. wide = 4yds. super.

Gilder.

There are two varieties of gilding, known as "oil-gilding" and "water-gilding" respectively. In "oil-gilding" the gold leaf is applied to surfaces which have previously received a preparatory coating of gold size consisting of size, linseed oil and a little ochre or other colouring matter. This form of gilding is used for all external work, as it is capable of withstanding the weather, and is also used for decorative work generally. Water-gilding is adopted chiefly for picture-frame work and for internal ornamentation requiring to be burnished. Surfaces requiring to be water-gilt receive 4 or 5 coats of whitening and size. The prepared surface is then thoroughly wetted with water, and the gold leaf gently floated on. Oil-gilding may be washed without injury, whilst water-gilding is too delicate to withstand such usage. Gold leaf is manufactured in 3 thicknesses, known as singles, doubles and trebles. It is made up into books containing twenty-five leaves each. Gold leaf is sold at per 1,000 leaves, or retail at per book.

1 book of gold leaf = 25 leaves (each $3\frac{1}{2}$ in. by $3\frac{1}{2}$ in.) = 1ft. 10in. super. = $1\frac{1}{2}$ ft. super. of plain gilding, including waste.

1 hundred of gilding = 100 leaves = 4 books = 5ft. super. of gilding approximately.

1 thousand of gold leaf = 1,000 leaves = 40 books = 50ft. super. of gilding approximately.

Electrician.

Ohm's Law.—The intensity or strength of an electric current in a conductor is directly proportional to the difference of potential or pressure at the ends of the conductor, and inversely proportional to the resistance of the conductor. This fundamental statement is called "Ohm's law" after Dr. Ohm, who scientifically investigated the action of electrical currents.

Measures of Electricity.

1 volt = unit of electromotive force (E.M.F.). This term is used to denote the potential or pressure of an electric current in a somewhat similar way as "lbs. pressure per sq. in." denotes the pressure of steam.

1 ampere = unit of electric current. This term denotes the quantity of electricity given by a dynamo, or passing along a wire, and may be compared to the quantity of water or steam passing through a pipe.

1 ohm = unit of resistance. This term refers to the resistance offered by a wire or other electrical conductor to the passage of the electrical current, and is analogous to the friction encountered by water or steam when forced through a pipe.

In further explanation of the terms volt, ampere, and ohm, respecting their relation to each other it may be stated that a volt is the pressure required to force a current of an ampere through a conductor having a resistance of an ohm.

The standard electrical instruments for respectively measuring a "volt," "ampere" and "ohm," as defined by Act of Parliament, are maintained in London at the laboratory of the Board of Trade.

1 watt = unit of electrical work = 1 volt-ampere = work done by a current of 1 ampere at a pressure of 1 volt, and may be compared to the expression "foot-pounds" as used by civil engineers.

1 kilowatt = 1,000 watts = 1,000 volt-amperes = $\frac{1}{3}$ horse-power.

1 horse-power = 746 watts = 33,000 ft.-lbs. per minute.

1 megohm = 1 million ohms.

1 microhm = 1 millionth part of an ohm.

1 mille-ampere = 1 thousandth part of an ampere.

1 Board of Trade unit (B.T.U.) = 1 kilowatt hour = 1,000 watt hours = 1,000 volt-ampere hours. This unit is adopted as the standard measure of electrical energy used for ordinary commercial purposes. It is obtained by multiplying the amperes, voltage and time in hours together and dividing by 1,000. For example, a current of 20 amperes at a pressure of 100 volts for 4 hours is equivalent to 8 B.T. units.

An electric current having a pressure of 100 volts is generally supplied for ordinary domestic purposes. The usual sizes for electric incandescent lamps are 5, 8, 16 and 32 candle-power. An 8-c.p. electric lamp takes about 30 watts for ordinary lighting purposes, and is practically equivalent to a 5ft. gas burner. A 16-c.p. lamp requires about 60 watts for efficient lighting.

Incandescent lamps are further classed according to the voltage or electrical pressure which they require to produce a given light. For ordinary purposes 100-volt lamps are generally used, this being the electrical pressure or voltage ordinarily given by the mains, but lamps of 50 or any other desired voltage may be obtained to suit particular requirements. A 100-volt 8-c.p. incandescent ordinarily requires 30 watts, or an electric current of .3 amperes at a pressure of 100 volts (100 volts \times by .3 amperes = 30 watts). The average "life" of an incandescent lamp is from 1,000 to 1,200 hours, provided that the voltage does not exceed that for which the lamp was originally constructed.

A B.T. unit will give an average of 34 hours' light with an 8-c.p. electric incandescent lamp, whilst 1,000 cub. ft. of gas will give 200 hours' light with a 5ft. gas burner. For domestic lighting purposes electricity at 6d. per B.T. unit may be taken as equal in cost to gas at 3s. per thousand cub. ft.

When an electric current flows continuously in the same direction it is known as a "continuous" or "direct" current, but if arranged to flow alternately in opposite directions it is termed an "alternating" current. The alternating current system is largely adopted when it becomes necessary to carry the electrical energy for a considerable distance from the generator; owing to the fact that a current of this description may be readily transmitted by means of a relatively thin and cheap conductor as compared to the thicker and more expensive conductor required for a direct current. The current may afterwards be "converted" or transformed as required.

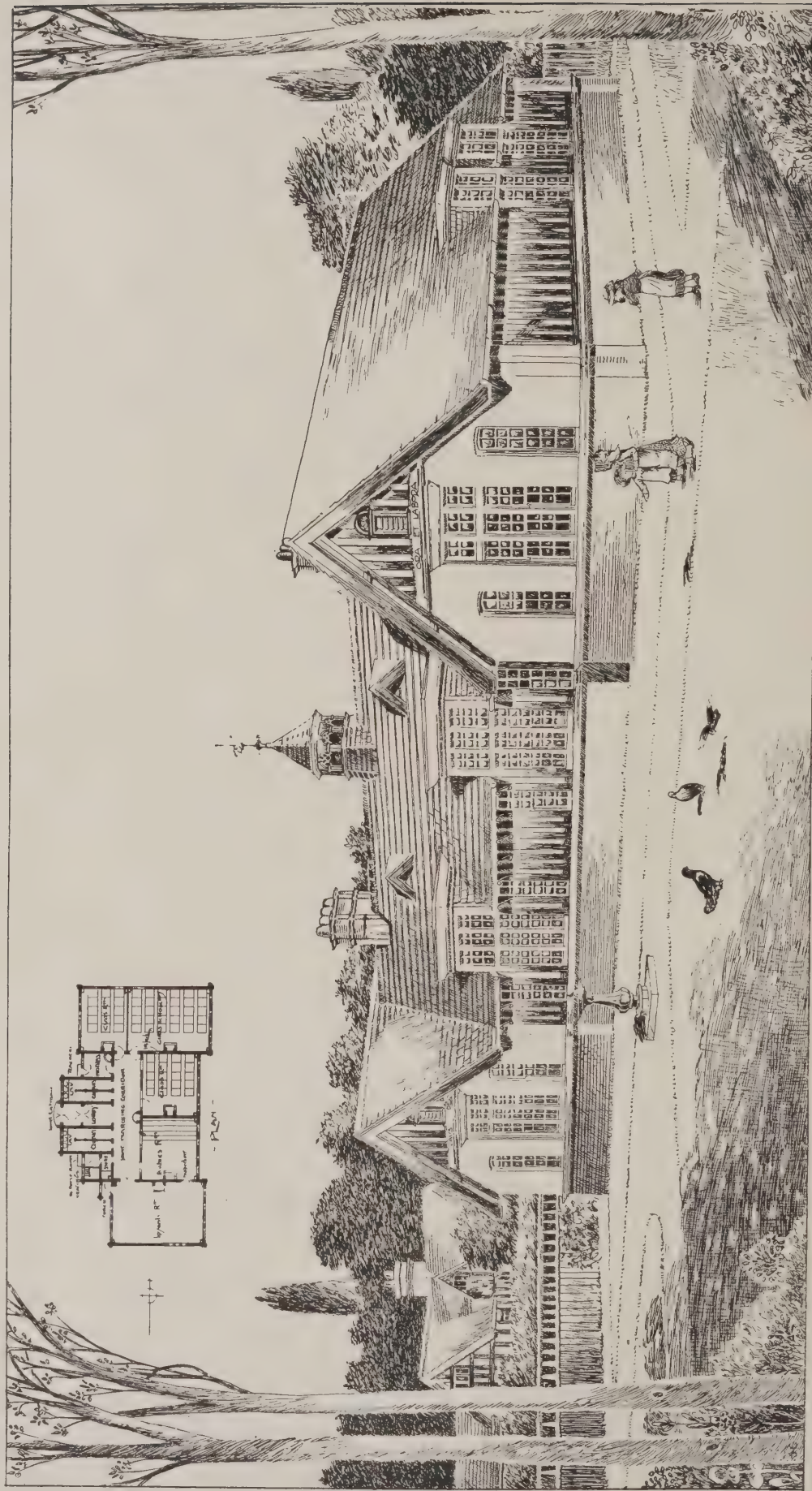
Prices of Building Materials.

When preparing specifications or bills of quantities, the difference in meaning between the terms "prime cost" (P.C.) and "list price" as used in connection with the supply of materials or fittings should be carefully noted so as to avoid any misunderstanding when the work is being executed. The approved conditions of contract sanctioned for use by the Royal Institute of British Architects state that "the words 'prime cost' or the initials P.C. applied in the specification to goods to be obtained and fixed by the contractor, shall mean, unless otherwise stated in the specification, the sum paid to the merchant after deducting all trade discount for such goods in the ordinary course of delivery, but not deducting discount for cash, and such sum shall be exclusive of special carriage, the cost of fixing and contractor's profit." The technical expression "prime cost" (or P.C.) is therefore generally understood to mean the ordinary nett trade price of the article or material, but exclusive of any special discount for cash, whilst the term "list price" (or L.P.) refers to the published price given in the manufacturer's catalogue or price list.

The prices of all building materials are continually fluctuating according to the market conditions of supply and demand, the cost of production, &c., and it is therefore essential that the contractor should make himself intimately acquainted with the lowest current market prices of materials, so that he may be in a position to obtain advantageous terms for their purchase and supply. A keen cash purchaser for fairly large quantities will naturally have no difficulty in obtaining goods at lower prices than the ordinary quoted market rates.

(To be continued.)

LIBRARY
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NEW CHURCH SCHOOLS, HADLEIGH, SUFFOLK. ARTHUR H. RYAN-TENISON, A.R.I.B.A., Architect.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to
 THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
 Wednesday, July 2nd, 1902.

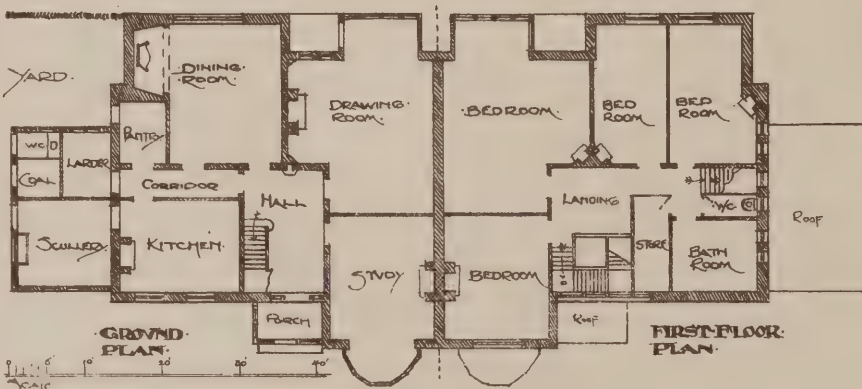


SIDE
 ELEVATION



FRONT
 ELEVATION

GARDEN.



SEMI-DETACHED VILLAS.
 HARPENDEN. FOR:
 FRANK O. SALSBURY ESQ.

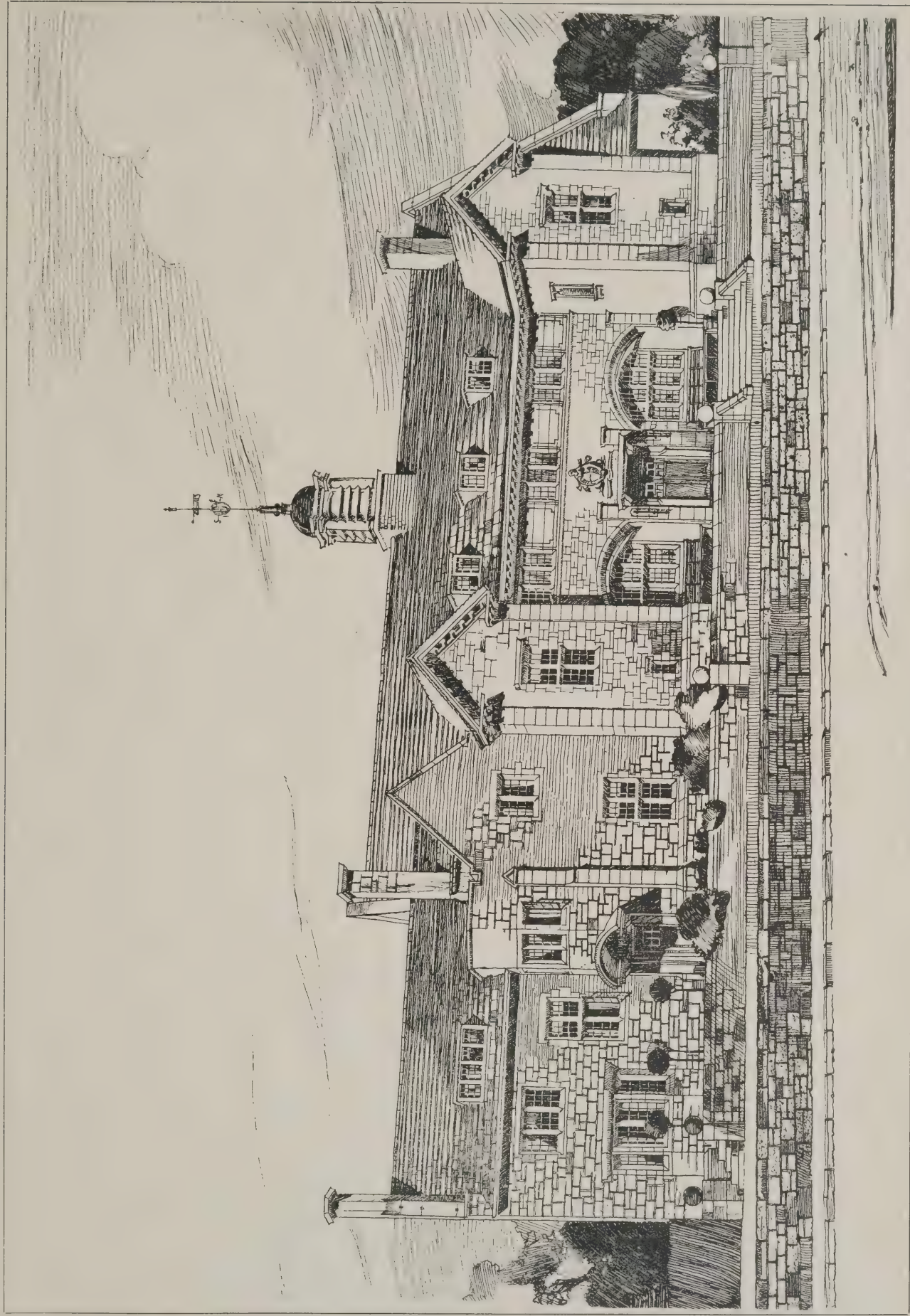
J. PERCY HALLAM
 ARCHITECT.
 6 VICTORIA GROVE, W.



BACK
 ELEVATION



LIBRARY
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A PRIVATE SCHOOL FOR FIFTY BOYS. A. A. CARDER, Architect.

LIBRARY
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Keystones.

The Birmingham Stock Exchange has opened new offices in Newhall Street.

Ernest Waterlow, Esq., A.R.A., president of the Royal Society of Painters in Water-Colours, becomes a knight.

Taw Sein Ko, M.R.A.S., F.A.I., F.S.A., Government archaeologist, Burma, has been granted the Kaiser-i-Hind medal for public service in India.

A New Baptist Chapel at Cadoxton-Barry has been erected at Weston Hill, by Mr. H. Fisher, builder, of Hannah Street, Cadoxton. It accommodates 400 persons.

A New Baptist Church at St. Budeaux is being erected. The building will accommodate 350 persons, and is provided with vestries and classrooms in addition. Sufficient land has been reserved for future extension, which will probably take the form of a chapel, in which case the present new building will be adapted to the uses of lecture hall and school-room. The total cost is over £1,800. The architect is Mr. Frank Clark, and the contractors are Messrs. Allan & Tozer.

A New Industrial School at Portslade, near Brighton, has been erected jointly by the London School Board and the Brighton School Board, at a cost of £30,000, to accommodate 120 boys. It stands in 26 acres of ground, and has large orchard, kitchen garden and playing field, and contains tailoring, shoemaking and carpentry shops, a steam laundry on the most modern system, and a large swimming bath. Already there are 111 boys at the school.

Browning Settlement.—The new club and coffee-tavern which have been built in connection with the Robert Browning Settlement, Walworth, were opened recently on the ninetyeth anniversary of the poet's baptism. The premises are situated at the corner of York Street, Walworth Road. Besides a spacious coffee-bar and dining-room, to which the public will be admitted, the members of the club have a reading-room, club-room, chess-room, library and two billiard-rooms. The structure and furniture have cost £5,000.

East-End Housing.—The completion of the works in connection with the Whitechapel and Bow Railway has resulted in considerable spaces of ground being cleared in the vicinity of the stations. One of these sites, which includes the well-known "Black Boy" public-house at Stepney Green Station, has come under the attention of the Stepney Borough Council, and a suggestion has been made that it should be acquired by the Council for the erection of workmen's dwellings, and it has been decided to bring the question under the notice of the Housing Committee of the London County Council.

A New Roman Catholic Church at Stanley has been erected at a cost of £7,000. The church is 138ft. in length, and will accommodate 650 worshippers in addition to the choir. Mr. Charles Walker, of Newcastle, was the architect, and the building is of Early English style, built in Heworth and local stone, with vaulted pitch-pine roof. The plastering, which is of a rich and ornamental character, was done by Messrs. Rule, of Sunderland. The building is heated by hot water, the apparatus having been installed by Messrs. Dilworth & Carr, of Preston; and the electric light has been installed by Messrs. Carrich & Co., of Gateshead. The terrazzo pavement is the work of Messrs. Geary & Walker, and the oakwork, including the front of the choir gallery and the doorways, was done by workmen from Belgium. The oak carving on the communion rail is by Messrs. Plaskett, of Carlisle. The stained-glass work was executed by three firms—Messrs. Mayer, of Munich; Barnett, of Leith; and Atkinson, of Newcastle. The columns are of red sandstone from Galloway. The tiling was done by Messrs. Wedgewood & Sons, of Stoke, and the woodblocking by Mr. Roger Low, of Bolton. The chief contractors were:—Building, Mr. W. Johnson, of Stanley; joinerwork, Mr. T. Mordue, of Dipton; painting, Mr. S. Swallow, of Stanley; plumbing, Mr. L. Urwin, of Shotley Bridge; and seating, Mr. Plaskett, of Carlisle. In all there are about twelve stained windows in the church.

A New Wesleyan Church at Bishop Stortford is being erected in South Street. It has been designed by Messrs. Gordon & Gunton, is estimated to cost £4,000 and will accommodate 580 people. The builders are Messrs. Feast, of Fillingham.

Aberdeen Municipal Buildings.—The Aberdeen Town Council have decided to carry out alterations and rearrangement internally of the wing of the Municipal Buildings fronting Broad Street and Concert Court, at a cost of £3,000 to £4,000, with a view to providing additional accommodation for the different Corporation offices and departments. Mr. Dyack, burgh surveyor, will prepare the plans.

A New Hall at Luncarty, near Perth, has been erected as reading- and recreation-rooms for the villagers of the district. The hall, which was designed by Mr. J. C. McKellar, architect, Glasgow, consists of a large recreation-room, reading-room, cloak-room and small kitchen. The contractors for the building were:—Masons, Messrs. Fraser & Morton, Perth; joiner, Mr. D. Crichton, Perth; plasterer, Mr. Mackay, Perth; and slater, Mr. Carmichael, Stanley.

A Municipal Crematorium at Bradford is proposed to be established. A report has been drawn up by the deputy town-clerk (Mr. Herbert Hankinson) and the city architect (Mr. F. E. P. Edwards). The only municipal undertaking of which particulars are given is the crematorium established by the Corporation of Hull at an initial cost of £3,122. The fee charged for residents of Hull is stated to be £1 1s. and for other persons £3 3s. At Glasgow and Manchester there is no distinction as to residence, and the fee is £5 5s., with a reduced charge for people of the working classes of £2 2s. The average annual number of cremations is shown to be as follows:—Glasgow 15, Hull 17, Liverpool 31, Manchester 68, and Woking 218. In Bradford the most economical course would probably be to erect a crematorium in the form of an annexe to an existing chapel in one of the municipal cemeteries.

The Exhibition of Flemish Art at Bruges, though chiefly noticeable for the collection of pictures, has a section devoted to Belgian antiquities from the earliest period to that of the Renaissance. Furniture, sculpture, tapestries, goldsmiths' work, brasswork, ivories, glass, stoneware, pottery and porcelain form another department. Coins, medals, seals, archives, MSS., miniatures and bindings make up the fourth section; while the fifth is devoted to lace, embroidery, Flemish damask and linen. Finally, there are reproductions of pictures, works of art and Flemish monuments, as well as historical documents. As there was no structure large enough to receive the vast array of Flemish art collected, it has been necessary to set apart the Academy of Fine Arts in the Government Buildings for pictures, and to utilise the Hôtel Gruuthuse for all other productions. The period which is represented is roughly that from 1380 to 1600, but after 1550 the works gathered are those of Bruges artists exclusively.

A New Free Library at Bideford.—The Bideford Urban Council recently had under consideration the erection of a new free library and municipal offices. Towards the cost of building a library Mr. Andrew Carnegie has given £1,600. The scheme of the Council is to demolish the premises adjoining the town hall, now occupied by Messrs. Hogg, and erect on the space thus secured the new library. The architecture of the new free library is to be in conformity with the present town hall, but a distinctive building. On the first floor is to be a council-chamber measuring 30ft. by 25ft., communication between the town hall and new council-chamber to be established. An ante-room to the council-chamber and lavatories are to be provided on the first and ground floors, and on the ground floor at the corner now occupied by Messrs. Hogg's premises would be a suite of offices. The library will have a 50ft. frontage adjoining Mr. Eiddie's premises, and the entire cost of the library buildings and fittings is not to exceed £1,600. The library is to be a one-storeyed building, with galleries, and heated with hot-water apparatus in the basement. There will be a bold hall, and an entrance common to the library and municipal buildings. Competitive plans will be invited, premiums of £30, £15 and £10 to be given.

Sir Edward Poynter, P.R.A., becomes a baronet.

Seven Cottage Homes at Cleethorpes are to be erected as a memorial of the Coronation.

Robert Harris, Esq., president of the Royal Canadian Academy, is to be C.M.G.

New Choir Stalls at Ripon Cathedral have been erected in the nave. They have been designed by Mr. J. Oldrid Scott, F.R.I.B.A., and are the work of Messrs. Thompson & Sons, of Peterborough. The stalls are of wainscot oak, elaborately carved, with tracery in front, and with carved bench ends. The book boards are designed in canopy form, the fronts having groined carving. Messrs. Thompson are also erecting a new lobby for the west doors, this being also in wainscot oak, with suitable carving.

Garrick Villa, at Hampton-on-Thames, is soon to disappear, as the ground upon which it stands has been acquired in connection with the tramway scheme to Hampton Court. David Garrick, the famous actor, lived in the house for many years, made many additions to it, and erected in the garden by the riverside a domed octagonal brick building, which he called the "Temple of Shakespeare." The high road divides the grounds of Garrick's Villa in two, and Garrick constructed an archway which united the two gardens.

A New Wesleyan Chapel and Schools at Tisbury, Salisbury, has been erected in High Street, at a cost of £1,700, by Mr. Huish, of Street, from plans by Mr. T. Wonnacott, F.R.I.B.A., of Southsea. The buildings are of Tisbury stone, with Bath-stone dressings. The style is geometric Gothic. The chapel, which will seat 220, is 30ft. in length by a breadth of 30ft. with open-timbered roof. There is a tower 70ft. high, surmounted a small steeple, with open belfry and arcading beneath it, which is repeated under the six-light traceried window at the front of the chapel. In the rear of the chapel are two vestries, and adjoining the chapel are school premises, separated from the main building by lifting shutters. The interior fittings of the chapel are of varnished pitch-pine. The buildings will be heated by hot water, and the ventilation is by Boyle's system.

Stepney Parish Church, which was much damaged by fire last year, has been reopened after six months' work and an expenditure of over £6,000 to make good the damage. Practically the whole of the roof was destroyed, only the chancel arch, two main beams in the chancel itself, and a few rafters at the west end of the nave remaining. Solid English oak has been used for the new roof. A new altar replaces the old one. Two-thirds of the east window are new, and the south chancel and north aisle windows and one of the windows in the clearstory are also new. The organ was entirely destroyed, but the new one, which is on order, will not be in position till next October. Of the vestry only the walls were left standing, and the stonework of the windows, the roof and the interior fittings have all had to be renewed. Opportunity has been taken to put in electric-light fittings, but these will not be in use till the autumn.

Bishop Creighton Memorial.—A meeting of the Memorial Committee was held last week. It was reported that one of the two portraits of the late Bishop by Prof. von Herkomer, R.A., had been sent to Fulham Palace, and that the Bishop of London had hung it in the dining-room among the pictures of Dr. Creighton's predecessors in the see. The other portrait would be hung in the National Portrait Gallery. Mr. Thornycroft, R.A., submitted the sketch-model of the statue of the Bishop for St. Paul's Cathedral. It represented the Bishop in his cope, with his pastoral staff in his left hand, and in the act of giving the blessing. It is to be placed in the choir aisle, between the carved surfaces of the oak screens. On the advice of the sculptor, supported by letters from Mrs. Creighton and the surveyor of St. Paul's Cathedral (Mr. Somers Clarke), it was decided that the statue should be erected in bronze instead of Carrara marble, as originally intended. Mr. Thornycroft said he proposed to add a bronze background and affix to the pedestal two panels representing History and Theology. It was stated that the statue would be finished by about October, 1903.

Mr. John Joseph Talbot, architect, of Birkenhead, died recently.

A Stained-Glass Window is to be erected by the parishioners and congregation of Emmanuel Church, Clifton, in memory of the late Canon and Mrs. Brennan. At a recent meeting of the memorial committee it was decided to accept the design submitted by Messrs. Joseph Bell & Son, of 12, College Green, Bristol. The window, which consists of three lights and tracery, will represent various scenes from the life of St. Paul.

A New Textile School at Ashton-under-Lyne has been erected at a cost of about £6,000. The ground floor comprises one of the finest spinning schools in Lancashire. The spinning-room measures about 80ft. by 60ft. and the weaving-room 40ft. square. The equipment is complete in every way. In the spinning department there is an elaborate series of machines, into the first of which the cotton is put, and it comes out of the last in the shape of "laps," without having been once touched by the hand. The weaving machinery is so arranged as to include processes which are not in general use in the district. On the first floor there are six good classrooms. The two largest measure 60ft. by 40ft. and 40ft. by 29ft. One of the smaller rooms is to be used for the cookery classes, and in the others teaching in machine drawing, building construction, commercial subjects, &c., will be given.

An L. B. A. Church at Muswell Hill, N., has been erected; the main gable is flanked on the right by a tower with spirelet, and on the left by a dwarf tower, both of which contain fireproof staircases to the gallery. There is a projecting narthex containing the main entrance to the ground floor in front. The whole of the seating is in a semicircular form. The ceiling is a wooden vaulted one, with a central crossing between four wide arches supported on columns. This vaulting is surmounted by an octagonal dome. The baptistery is kept open and is marble-lined. Ladies' and gentlemen's choir and baptizing vestries are placed immediately behind the pulpit, and there is direct access from the baptistery under the pulpit. Deacons' and pastor's vestries are provided. There is a large schoolroom with all necessary classrooms, ladies' working-room, superintendent's room, infants' room, kitchen, heating-chamber, &c., under the church. Red-brick facings and Bathstone and Costessey dressings have been used, and the roof is slated. The estimated cost is under £8,000. The adult seating accommodation is for about 472 on the ground floor, 30 in the choir, 268 in the gallery, or for a mixed congregation of about 900 persons. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C.

A New Wesleyan Chapel at Coppull is being erected in Spendmore Lane. The buildings will consist of a church, with orchestra, minister's vestry, schoolroom, infants' room, three classrooms, kitchen, &c. The front elevation of the church is set back 36ft. from the road, and there is to be a central front entrance porch. The rostrum and communion table are at the other end, and behind the former will be the orchestra, connected with the church by a moulded arched opening. The schoolroom and classrooms are to be at the rear, and will have direct communication with the church. The classrooms abut on the schoolroom, and two will be provided with movable partitions to allow them to be converted into one room for assembly purposes. Arrangements are being made to allow the construction of an end gallery at the front of the church as occasion requires. The roofs internally are to be partially "open," with visible timbers stained and varnished. Inside, the walls and the ceilings will be plastered. All internal joinery is to be of pitch-pine and varnished, and the pews will be of the open style. The buildings will be faced externally with patent pressed bricks, relieved with Yorkshire-stone dressings, and the windows to the church and orchestra will be glazed with lead lights. The church will provide accommodation for about 290 adults, or a mixed congregation of about 350 persons, and the school and classrooms will seat about 330 scholars. Mr. W. Hampson, of Chorley, is the contractor; and Mr. W. H. Dinsley, of Chorley, is the architect.

New Buildings at Felsted School are being erected. These consist of a large school and eight classrooms, of which the classrooms are nearly completed. The new block was designed by Sir Arthur Blomfield & Sons, the builders being Messrs. Hunt, of Hoddesdon.

A New Congregational Church at Wigan is being erected. It will be in early Gothic style, with spire, and will be built of Yorkshire parpoint stone. It will cost about £5,500, and will provide seating accommodation for 750 members, and the choir-stalls will provide for an additional fifty persons. Mr. F. W. Dixon, of Oldham, is the architect, and Messrs. Joseph Wilson & Co., of Wigan, are the builders.

Architectural Photographers will be glad to hear of the Goerz hypergon lens. It includes the widest angle hitherto realized by any stationary lens—135 degs.: so that a building 85ft. high, even if in a street only 24ft. wide, could be photographed face on, provided the camera were placed in an upper window in a house opposite, or working from the ground-level the building could be photographed from a distance of about 45ft. The lens itself consists of two hollow hemispheres so joined that they look like a glass marble set in a rather large plate of blackened metal.

A New Wesleyan Chapel at Madron, Cornwall, is being erected. It will accommodate 200 persons, and there will also be a Sunday school for 100 children, with a vestry and suitable offices. The building will be Gothic in design, of granite, with open roof, the internal fittings being of figured pitch-pine. The plans have been prepared by Mr. Henry Maddern, architect, of Penzance; and the contractors are Mr. Joseph H. Nicholas, Penzance (masonry), Mr. R. Walters, Penzance (carpentry), and Messrs. J. M. B. Corin & Son, Penzance (plumbing). The entire cost will be about £1,150.

New Council Offices at Horbury are being erected in Westfield Road from plans by Messrs. Walter Hanstock & Son, of Leeds and Batley. The first floor will contain the council-chamber. At the rear will be stabling and sheds for the carts and road rollers, together with plumber's shop, workmen's sheds, &c. The cost will be about £5,000. The following tenders have been accepted for carrying out the work:—Messrs. H. Fallas & Sons, masons, Horbury; Mr. William Horsnell, joiner, Ossett; Mr. James, Walshaw, plumber, Batley; Mr. H. Sanderson, plasterer, Ossett; Messrs. John Atkinson & Son, slaters, Leeds; Mr. J. Hancock, painter, Horbury; Mr. James Walshaw, heating engineer, Batley. Mr. A. E. Radcliffe, engineer and surveyor to the council, has been appointed clerk of works.

A New U.F. Church at Blairgowrie has been opened. The architects were Messrs. D. & J. R. Macmillan, of Aberdeen, whose plans were selected in competition. The style is Early English Gothic, with transepts, aisles, apse and a small back gallery. The aisles are divided from the nave by an arcade formed with polished stone pillars and with heavy polished stone arches above. The aisles are lighted by small windows with cusped heads, and the nave by clearstory windows above the arches, as well as by a large window in the south gable. The transepts are each lighted by five lancet-headed windows, while the apse is lit by a five-light window high enough to allow an organ to be introduced at any time without interfering with the light. At the back of the church is the gallery, with accommodation for seventy-six persons. The internal finish of the roof is in the form of a semicircle, lined with wood, having the principal trusses at intervals, resting on heavy-moulded pillars and ornamental stone corbels. The sitting accommodation is 750. Heating is on the low-pressure system. The tower, which externally is the most important part of the structure, is not yet completed. The full height, with spire, will be 130ft. The cost has been about £7,000. The contractors for the work were:—Mason, J. McLeish, Rattray; joiners, Leslie & Hay, Aberdeen; plumber, G. P. Kidd, Blairgowrie; slater, R. T. Craigie, Blairgowrie; plasterer, J. Bell, Blairgowrie; painter and glazier, E. Copeland, Aberdeen; heating engineers, J. S. Fraser & Son, Rattray; fitters of lightning conductors, Westwood & Son, Perth. The whole work has been supervised throughout by Mr. L. Falconer, architect, a leading member of the congregation.

Church Bells.—The six bells of Milton Abbot parish church, cast by J. Pennington in 1769, have been quarter-turned, provided with fresh fittings, and placed in a new oak frame at a cost of about £130.

More Carnegie Libraries.—In addition to the grants for free libraries made by Mr. Carnegie, he has undertaken to erect and equip two such institutions, at a cost of £4,500 each, in the metropolitan borough of Lewisham, one at Lower Sydenham and the other at Brockley. Mr. Carnegie is also giving £6,000 for library buildings at Merthyr Tydfil.

Two Blocks of Self-contained Residential Flats, to be called "Polo Mansions," are to be erected at the corner of Linver Road and Hurlingham Road, S.W., and a roof garden has been arranged overlooking the Polo Club Grounds. Messrs. Mead & Burton's (Chesham) tender has been accepted, and they will proceed with the work at once from plans and under the direction of Messrs. Palgrave & Co., architects, Westminster, S.W. Mr. J. Farrell is clerk of the works.

Clonfert Cathedral Restoration.—The cathedral of Clonfert possesses a unique interest. It is one of the smallest cathedrals in the three kingdoms, and was founded by St. Brendan, the navigator, in 558 A.D., thirty-nine years before St. Augustine landed in England. It is now being restored under the supervision of Mr. J. F. Fuller, F.S.A. The sum of £2,425 has already been expended, of which £2,000 has been raised. A debt of £400 remains, to clear off which and to complete the restoration a sum of £1,500 will be required.

A New Church at Seven Kings, Ilford, to be dedicated to St. John, is being erected. At present it is only proposed to erect the chancel, side chapel, organ-chamber, two bays of the nave and the aisles. This will cost £2,329, and will provide accommodation for 480 persons. The design of the church will be a free rendering of the Perpendicular. The dimensions are: nave, when completed, 79ft. 3in. in length, and the chancel 37ft. 8in. When wholly complete there will be sufficient seating room in the edifice for 802 persons, and the total cost will amount to £7,000. The builder is Mr. John Bentley, of Waltham Abbey, and the architects are Messrs. J. E. K. & J. P. Cutts, of London.

The Work of Re-hanging the Bells of Exeter Cathedral, which are the heaviest ringing peal in the world, has been completed. The original scheme embraced simply the re-hanging of the eleven bells forming the peal, the provision of two pits for bells which, it is hoped, will be eventually added, and the execution of necessary masonry and carpentry. The estimated cost of this was, roughly, £1,300. But the original scheme was enlarged. When the bells were lowered by Messrs. Taylor & Son, of Loughborough, the contractors for the re-hanging, it was found that considerable additional masons' and carpenters' work would be necessary, while expert opinion as to the advisability of re-casting the tenor and fifth bells, which were flat, prevailed against sentiment, which was opposed to interference with the set which had done duty for many generations. There were a few other items, and altogether the sum required was advanced to £1,670, exclusive of the cost of re-casting the fifth.

Loughborough Parish Church.—During the installing of the new heating apparatus it was found that dry-rot had made very extensive havoc of the oak floor plate and the joists which sustained the flooring and the seats. It was fortunate that this mischief had been discovered, as if it had been allowed to go on unchecked it would in time have ruined the beautiful oak seats which are of such a massive description. The floor plate had been taken out all round the church, and blue bricks put in instead. Among other alterations the two front seats in the nave have been removed. The pulpit has been removed slightly to the north of its old position. The choir stalls have been raised 5in. The improvement in the acoustic properties of the chancel is very marked, and the choir can now be seen and heard to greater advantage than before. The tablets in the tower have been removed to the Burton chapel, so as to make room for the pedal pipes of the organ, which will be placed against the north and south walls of the tower.



NATIONAL BANK OF COMMERCE BUILDING, ST. LOUIS, MO., U.S.A.

ISAAC S. TAYLOR, ARCHITECT.

Views & Reviews.

A Tour in Hertfordshire.

One cannot go far in Hertfordshire without having some famous man of letters recalled to mind, or without encountering some old building—church, house or barn—where the architect can roam and admire, or the student busy himself with his pencil and sketch-book.

In this book the author wanders into all the highways and byways of the county, telling the incidents that have made many houses notable, these incidents being literary, historical, though seldom architectural. Rye House and its plot will always be remembered, but the house was partly demolished nearly 200 years ago and some fragments of red-brick wall only remain, attached to the present inn: one can never forget however that "pleasant hale old man," Isaak Walton, who fished so often in the River Lea that flows past the Rye House. Not three miles distant, on a wooded slope, is the little village of Amwell, and near the church one finds an old brick mausoleum erected to perpetuate the many who bore the name of Mylne, amongst whom was Robert Mylne, a lineal descendant of John Mylne, who was master-mason to King James III. of Scotland, "and he it was who 'designed and constructed the magnificent bridge of Blackfriars, London' [not the present structure, of course], and had once 'the superintendence of the Cathedral Church of St. Paul.'" Ware is not far away, and "The Johnny Gilpin" reminds us of that train-band captain and his runaway horse. Pepys, de Quincy, William Godwin, Charles Lamb, and other famous names are also associated with Ware. Hertford itself has a castle, Hatfield its well-known House, that home of the courtly Cecils, and Tewin attracts visitors by Queen Hoo Hall and an altar-tomb riven asunder by several trees rooted in the grave beneath. Our author says: "The Palace of Hatfield, as such, is a thing of the past; it is the house which monopolises attention. The marble hall, with its ceiling of painted panels and walls of oaken wainscot, covered with tapestry; the grand staircase, hung with portraits by Lely, Kneller, Zuccherro and other masters; the long gallery (163 ft.) adorned with antique furniture, choice old pictures and coats of mail; King James's room, flooded with light from its oriel windows and embellished with all that the wit of carver or gilder could devise; the dining-room, overlooked by the marble bust of Burleigh; the armoury, with its relics of the great Armada; the chapel, with its Flemish window and marble altar-piece; the many bedrooms where you may notice, if you notice little else, the richly-carved Jacobean wardrobes—these are but a few of the prominent features of interest shown to visitors when their owner is from home." From



NORTH MIMMS. DRAWN BY F. L. GRIGGS.

Hatfield our author takes us through Welwyn and Wheathampstead to St. Albans. At the last place the Abbey furnishes abundant material for comment, and there are also St. Peter's Church and Old St. Michael's to be spoken of. Then we come to Watford; and though it is observed that the restoration of the old parish church was carried out in 1871 at a cost of £11,000, there is not a line in reference to the late Mr. Bentley's church. Moor Park is next referred to, where a Corinthian portico and Tuscan colonnades were added by a man named Styles,

and where Thornhill painted the ceiling of the saloon: Styles is said to have spent £150,000 altering and adorning the house, Rickmansworth is close by. Thence we go through Sarratt, Abbot's Langley (where is the old church of St. Lawrence), King's Langley and its ivy-covered priory, Chipperfield manor-house—"so spacious and so inviting that you can hardly observe it and keep the tenth commandment"—and so to Hemel Hempstead and Berkhamstead, the latter famous for its delightful old rectory where Cowper was born in 1731

and for numerous old specimens of English domestic architecture—such as Egerton House and the almshouses, "the gift of John Sayer, Esq., 1684." Then to Tring. Here is much study for the architect. In the midst of the Park is the home of Lord Rothschild. There is also, like everywhere else, the parish church, which, by-the-by, was restored about twenty years ago by Mr. Bodley.

Thus the author takes us through Albury and Gaddesden, Flamstead, Redbourn, Harpenden (the valley of nightingales and "a conglomeration of the picturesque and the unsightly, of the old and the new"), Kimpton, King's Walden, Hitchin, Baldock, and many other places, all on a circuitous route that finally leads through Bishop's Stortford to the village of Widford. Here the pilgrimage ends.

As the author remarks in the first chapter, he sets himself to interest a variety of readers having tastes of all kinds. He makes no claim to architectural qualifications, and indeed he has none, as many passages show (such as—"passing the village of New Marford with its pretty cottage homes of diverse architecture," p. 43). So far, therefore, as strictly architectural merits are concerned, the letterpress of the book has no attraction for us;



HAMMOND'S FARM, PIRTON. DRAWN BY F. L. GRIGGS.

but the numerous illustrations make up this deficiency to the architect. Mr. Griggs's drawings are excellent. The accompanying illustrations show this. The work is thoroughly straightforward, strong and free; and though we do not approve all his little tricks of sky-lining and cross-hatching, Mr. Griggs must certainly be counted among the best architectural draughtsmen of the day; and it is for this reason that the book under review will delight all those interested in architecture.

"Highways and Byways in Hertfordshire," by Herbert W. Tompkins, F.R.Hist.S., with illustrations by Frederick L. Griggs. London: Macmillan & Co., Ltd. Price 6s.

Anglin's Design of Structures.

Mr. Anglin's book is well known, and its usefulness is proved by its having reached a third edition. This edition has been revised and enlarged, a chapter on the foundations of buildings being added and several tables in the form of an appendix. This chapter on foundations is extremely elementary and not of much use, for the subject is dealt with more thoroughly in most books on construction. We should have thought that Mr. Anglin would have followed the plan of the rest of the book and shown how to calculate the strength of foundations, with illustrations of methods of safely and uniformly distributing the pressure, such as bonding, steel grillage and rafts, concrete combined with steel, bedding of stanchions and columns, sheet piling, sand piles, &c. We notice, too, that 400lbs. per sq. in. after seven days is given as the proper strength to specify for Portland cement. It is quite needless to require such a figure as this, which is often secured at the expense of ultimate strength after several months; 350lbs. is quite sufficient. It seems to us that more emphasis might usefully be laid on the unequal pressure on foundations where the ground is of varied consistency at different parts of the same site. This variation of compressibility of subsoil is often considerable on very small areas, especially where part of a site is made ground. In extended factory buildings it becomes important that the pressure on the foundations per sq. ft. should vary in order that equal settling may be secured.

In our opinion the book could be considerably improved by abbreviation. It is of course very helpful to have fully worked-out examples, but there are far too many duplicates in the book and the explanations might often be shortened with advantage. It is not wise, either, to include too many variant methods of working out calculations (for such theoretical matters are dealt with more completely in other works) and the purpose of practicability is served better by giving the best and generally adopted methods. The graphic method of calculating stresses is dealt with very fully, but the examples of working out inclined loads due to wind-pressure in roof-trusses are very meagre. Vertical loads on roof-trusses are easily worked out, but the student usually finds considerable difficulty with wind-pressure on trusses fixed at one end and at both ends. Indeterminate examples should also be very fully gone into.

The information on stanchions and columns is very scanty, especially in regard to determining the neutral axes and moments of inertia of built-up sections, and the radii of gyration. It is in finding these that difficulty is usually experienced, although the subject is simple in itself. Eccentric loading of stanchions is not dealt with, though most important. In high buildings of steel framework, such as American office buildings, these matters become of the utmost moment. The book of course only deals with iron and steel construction, and not with structural design in general, as might be supposed from the title. One of the chief advantages of the book is that it requires of the reader only an elementary knowledge of mathematics.

"The Design of Structures: A Practical Treatise on the building of Bridges, Roofs, &c.," by S. Anglin, Master of Engineering, Royal University of Ireland. Third Edition. Price 16s. London: Charles Griffin & Co., Ltd., Exeter Street, Strand, W.C.

Mr Matthew Ridley Corbet, A.R.A., died last week at the age of fifty-three. The "Val d'Arno," which was exhibited at the Royal Academy in 1901, and which was bought by the Chantrey Bequest, give him a foremost place in the affections of all who care for political landscape.

OAKWELL HOSPITAL.

A NEW hospital at Oakwell is to be erected from plans prepared by Mr. J. W. Burrows, architect (Birstall & Mirfield), and the following tenders have been accepted:—For excavating, drainage, masonry, brickwork, &c., Messrs. W. & H. Sykes, Morley; carpenters' and joiners' work, Messrs. Martin Willans & Son, Birstall; plumbing, glazing, &c., Messrs. E. Walker & Co., Heckmondwike; slating, Mr. Jonas Thornton's Sons, Heckmondwike; plastering, Messrs. William Parker & Sons, Heckmondwike; painting, Mr. Tom Batty, Drighlington; machinery, furnishing contracts, and other matters will be considered later. The total amount of the accepted tenders is £6,698 4s. 2d., but the whole scheme (inclusive of the site, furnishing and laundry machinery) will involve an expenditure

matron's, nurses and servants' bedrooms, two linen stores, bathroom, &c., and housemaid's sink-closet. The scarlet-fever pavilion, typhoid-fever pavilion and the half-isolated pavilion, one-storeyed buildings, will each contain two wards. The laundry block will consist of washhouse, finishing and ironing rooms, boiler-house, stable and hay loft, ambulance shed, infected and disinfected van sheds, two washing yards and out-buildings. A steam disinfecter is to be placed between two rooms, with a basement for a calorifier. The mortuary will contain two slabs, lavatory, sink, &c., annexed to which will be a visitors' lobby, separated from the mortuary by an air-tight glazed screen, and entered by a separate external door. The discharge block contains undressing room, bathroom and dressing-room, and is placed near the main entrance. The whole of the buildings are to be erected in bricks



STANSTEAD ABBOTS CHURCH. DRAWN BY F. L. GRIGGS.

of about £10,000. The site is known as Foxhall Farm, and comprises about 8 acres. It is at a high altitude, lying to the left of the Great Northern Railway between the Howden Clough and Drighlington Stations, and may be approached from Geldard Road by Dark Lane, and from Fieldhead Lane by Owler Lane. The buildings to be erected will be administration block, scarlet-fever pavilion, typhoid-fever pavilion, half the isolation pavilion, laundry block, mortuary block and discharge block. In the basement of the administration block will be a spacious larder and coal cellar; while the ground floor will contain the matron's and doctors' room, dispensary, matron's store, nurses' dining- and sitting-room, lavatory and w.c., kitchen, scullery, housemaid's pantry, cook's pantry, caretaker's living-room (with separate entrance porch), caretaker's bedroom, and front entrance, also separate entrances for the nurses and tradesmen. On the first floor will be the

with stone dressings, and the roofs are to be covered with dark blue Westmorland slates. All the floors of the wards are to be laid with polished maple, and the walls of the pavilion finished inside with Parian-cement plaster, all the salient internal angles being rounded. The woodwork in the pavilions will be of pitch-pine, and the wards will be ventilated by means of extract ventilators placed on the roofs, and up-cast inlet ventilators on the walls. For the heating of the wards Shorland's hospital stoves are being introduced.

Two systems of drainage will be provided, one for surface water and the other for sewage. Owing to the fact that there is no main sewer within reasonable distance, outfall works for the treatment of the sewage will be constructed on a portion of the site reserved for that purpose. The two pairs of bacteria beds will be fitted with Adam's patent automatic alternating syphons.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

A Gloucestershire Sketching Tour.

BIRMINGHAM.—REX writes: "I propose to go on a tour in Gloucestershire sketching and making measured drawings of the old examples of domestic work there, and should be glad of any suggestions."

Gloucester is full of excellent examples of domestic architecture, something worth sketching being found in almost every village. Without suggesting that they are better than other buildings in the county, one may mention, as examples of mediæval work, Berkeley Castle, Beverstone Castle, Buckland Rectory (rebuilt 1520), a fine barn in the Decorated style at Calcot, several houses at Chipping Campden, and a small Perpendicular house with a good doorway and windows at Darsley. As examples of Early Renaissance work there are Cold Ashton Hall, a fine gate-house at Stanway, the porch of the manor-house at Upper Slaughter, the manor-house at Cold Ashton, the Swan Inn at Lichlade and the Market House at Chipping Campden; besides the Elizabethan and Jacobean manor-house at Horton, and many fine half-timbered houses in Tewkesbury, in excellent preservation. In Gloucester itself will be found the crypt of the Grammar School House, a plain building of the late Perpendicular or Tudor period, with walls, doors and windows perfect; a fifteenth-century timber-house at the corner of Northgate Street, containing some good oak carving; and also Robert Raikes' house.

G. A. T. M.

London Matriculation Examination.

NORTHAMPTON.—ROBBIA writes: "To whom should I apply for particulars of the London Matriculation examination?"

Obtain the latest edition of the "London Matriculation Directory" (published by W. B. Clive & Co., 157, Drury Lane, Strand, W.C.).

Concrete Floors in Prison Cells.

CHESTERFIELD.—PUPIL writes: "What thicknesses of concrete are necessary for floors of prison cells and floors of rooms over to meet the regulations of the Home Office? Can I obtain a copy of these regulations, and where?"

Application should be made to the secretary, Prison Commission, Home Office, S.W., giving full particulars as to your requirements. For ordinary military or regimental purposes the floors of cells must be of cement-concrete not less than 6in. thick.

T. E. C.

The Ionic Volute.

ROCHDALE.—W. D. writes: "Which is the best method of striking the Ionic volute?"

See p. 477 of our issue for January 23rd, 1901.

Roofing Hall.

SHERBORNE.—H. H. W. writes: "Which is the best way to roof in the hall (85ft. by 50ft.) indicated by the accompanying sketch (not reproduced)? I want to avoid any support from below."

We would suggest the use of semicircular laminated wood arches, similar to those used in the Grand Avenue of the Glasgow Exhibition, 1901, and illustrated in our issue for March 12th last.

Books on Egyptian Art and Mythology.

BURSLEM.—WINGED DISC writes: "Which are the best and most complete works on Egyptian mythology and literature?"

The following are recent works, and give a fairly complete record of Ancient Egypt and its

inhabitants:—W. M. F. Petrie, "History of Egypt" (2 vols.); Perrot and Chipiez, "The Art of Ancient Egypt" (2 vols.); G. Maspero, "Egyptian Archaeology" (translated by A. B. Edwards); E. A. W. Budge, "Egyptian Religion"; W. M. F. Petrie, "Ten Years' Diggings in Egypt." With regard to literature, Mr. Petrie has published two volumes of Egyptian tales. The publications of the Egypt Exploration Fund give full records of recent researches and discoveries, and should be consulted for information later than the date of the works above mentioned.

Payment for Plans not Carried Out, and Right to Dispose of Them.

LONDON.—E. A. S. writes: "A instructed B to make a survey, prepare plans, &c., for a new road through a piece of land which A intended to purchase. The road was passed after considerable trouble; but A then refused to purchase the land. B sent an account to A, but cannot see him nor obtain replies to letters. The owner of the land is now willing to purchase the plans. May B sell them to him, and, if so, what should B do with A's account, as B also did other work besides this?"

The plans having been prepared for A, he can be compelled to pay for them and also for the other work done. If the owner wants the plans he should arrange with A for their purchase; and as A shows a disposition to avoid payment, he will no doubt welcome relief from part of the expense. If however B were engaged by A simply as a professional man to carry out the road for him, we are of opinion that the plans belong to B, for if the road had been made A would have the value of B's services in the executed result, and the failure to proceed is his and not B's. A must pay B for his services, but cannot demand his memoranda and notes, i.e., plans and specification, which contain professional knowledge, experience and invention beyond what A is paying for. If B considers he is in this position he can both demand payment from A and sell the plans to the owner of the land or carry the work out for him from them.

Masters and Men.

The Bristol Dispute Settled.—Mr. A. A. Hudson K.C., has had a private conference with representatives of Bristol builders and of various operative societies with a view to the settlement of differences which had recently arisen. The Bristol Master Builders' Association had served notices upon sundry operative societies in the building trade for certain alterations in the rules to come into effect on June 30th. On application being made the Board of Trade appointed Mr. Hudson as a conciliator under the Trade Disputes Act. The conciliator considered it would be very unwise to dislocate the rule as to wages, and that the employers, when they gave notice in December last, were quite justified in doing so, considering the state trade was in at that time; then the war showed no prospect of early settlement, and things did not look very hopeful as far as the near future was concerned. But undoubtedly trade had revived, and the outlook was more hopeful than it was expected to have been. He considered the operatives had made out a case for no reduction of wages taking place.

A New Church at Salford, to be dedicated to St. Ignatius, is now being erected. The site fronts Oxford Street. The new church is calculated to seat 500 persons. The Romanesque style has been adopted. The materials are bricks with terra-cotta dressings, and the nave columns are of Runcorn stone. The east end is apsidal, and the columns of the chancel and reredos are of variegated Devonshire marble. A tower of campanile character will stand at the west end, near Oxford Street. In addition to the usual church accommodation, a large parish room is provided in the basement under the choir vestry and south transept. The architects are Messrs. Darbyshire & Smith, and the foundations are being executed by Messrs. William Brown & Son, contractors, of Salford.

Surveying & Sanitation.

Westminster Paving Contract.—The Westminster City Council will require Mr. E. Alcott to pave with red-gum wood blocks 10,000 sq. yds. of the roadway at the junction of Brompton Road and Knightsbridge Road, as it is in a defective condition.

Piccadilly Widening.—The Westminster City Council has resolved that they consider the widening of Piccadilly between Sackville Street and Piccadilly Circus one of the most needed of all projected county improvements, and that they approve the action taken by the London County Council to secure the said widening.

New Patents.

These patents are open to opposition until August 4th.

1901.—Timber Sawing.—12,283. W. H. REYNOLDS and P. BRAUER, both of Oulton, Suffolk. The novelty in this invention is the use of two saw carriers at either side of the machine, by which it is possible to do double the work with less power.

Scaffolding.—12,882. A. H. WAGGETT and S. J. WAGGETT, both of 21, Ford Street, Lower Broughton, Manchester. A platform is arranged to move up and down two standards, by means of hand-gearing. This consists of a worm at each side which works in cast-iron rackwork fixed to the standards, so that the platform can be raised or lowered with ease.

Sewage Filters.—13,832. S. H. ADAMS, Park Avenue, Harrogate, and A. CREER, Clifton, York. This invention relates to the use of a revolving distributor having arms so arranged that, owing to their relative levels, a minimum of flow is taken by those at the lower and an increased flow by those at the higher levels. The invention also includes a filling material consisting of flat or arched tiles so arranged as to give the liquid a zigzag, lateral or spiral travel.

Portland or Hydraulic Cement.—15,029. N. T. ASHTON, Market Place, St. Ives; J. CROMPTON, Abbots Nook, Chester; and J. B. KELLY, 13, Queen's Insurance Buildings, Dale Street, Liverpool. Portland or hydraulic cement is made from the natural calciferous sand known as "Towan sand," by first grinding it, then firing at a high temperature, and grinding again, all in a dry state.

The following specifications were published on Saturday last, and are open to opposition until August 11th. A summary of the more important of them will be given next week. The name in italics is that of communicator of the invention.

1901.—11,540, FORSTER & LIVERSEDGE, refuse destructors. 13,154, ROBERTS, continuous cement and lime kiln. 13,388, CARL means for actuating and securing sliding windows. 14,152, POLLOCK, fasteners for window sashes. 14,408, CHAMBERLAIN & HALL, folding lavatories. 14,456, SHOOTER, varnish. 15,142, PETERSEN, locks. 15,160, GIBBS, safety-guard for hand-fed wood planing machines. 20,678, DAVIES, means for automatically opening and closing safety doors of lift-wells. 24,862, ALLEN, tower bolts.

1902.—2,357, DRAKE, construction of arch specially applicable to ovens, kilns, &c. 4,109, BROOKE, pipe joints. 5,363, SHRIVELL & SHRIVELL, casement windows. 6,336, DUMAS, new trusting arrangement for iron and cement constructions. 6,337, CLAUSON-KAAS, coating wooden surfaces, brick walls, &c. 7,170, NAUE, chimney tops or ventilators. 7,185, WRIGHT, steam road-rollers. 7,226, GREEN, taps. 7,571, KRAUSE, calculating scale or slide. 7,738, FABRY, securing glass in windows, &c. 7,829, BROOKES (Rawson & Morrison Manufacturing Co.), hoisting apparatus. 7,997, REHAHN, clamp-iron for scaffolding. 8,786, KRAUS & KRAUS, machines for moulding plastic patterns on wall-paper. 9,219, HOLUB, copying machines. 9,426, BLANCHER, plate for use in making copying stencils.

New Companies.

The Metallic Art Co., Ltd.

Registered to acquire and carry on the business of the Metallic Art Company, furnishers to the Admiralty, founders in bronze, brass engravers, &c. Capital £10,000 in £1 shares (3,400 six per cent. preference). Registered offices: 53, Waterloo Street, and 212, Dumbarton Road, Glasgow.

Birkenhead Granite Flag Co., Ltd.

Registered to acquire and turn to account any real or personal property. Capital £2,500 in £1 shares. Registered office: 22, Sir Thomas Street, Liverpool.

Hughes' Patent Nut Fastener, Ltd.

Registered to carry on the business of manufacturers of and dealers in and with an improved means of locking nuts, in the United Kingdom or elsewhere; as engineers and metal founders, &c. Capital £15,000 in £1 shares.

Stourcliffe Estate Co., Ltd.

Registered to acquire certain freehold land at Pokesdown or Stourcliffe, in the parish of Christchurch, Hampshire; to adopt an agreement with C. Hunter; to acquire and deal in and with any land, house and other property. Capital £20,000 in £1 shares. The first directors are C. Hunter, A. C. Hunter and E. W. Hunter.

T. & E. Low, Ltd.

Registered to acquire the business carried on at Old Hill, Staffordshire, as T. & F. Lowe, and to carry on the business of timber merchants, sawmill proprietors, timber growers, &c. Capital £20,000 in £1 shares. Edward Lowe is permanent governing director. Registered office: Powke Lane, Old Hill, Staffordshire.

New Shildon Brick and Tile Co., Ltd.

Registered with objects indicated by title. Capital £500 in £10 shares.

Stiff's Concrete Co., Ltd.

Registered to carry on in the United Kingdom or elsewhere the business of manufacturers of concrete paving slabs, kerbs, copings, manhole covers, window sills, and all kinds of architectural work; as general contractors, marble merchants, brick, tile and terra-cotta manufacturers, makers of stone ware and plastic material. Capital £7,000 in £1 shares.

Frederick Mountford & Co., Ltd.

Registered to acquire certain patents relating to the glazing of bricks, tiles, pottery ware, glass, metal, &c., and to acquire the business carried on at Stoke-on-Trent, Staffordshire. Capital £2,000 in £1 shares. Registered office: 13, Cheapside, Hanley.

Bridley Manor Estates, Ltd.

Registered to acquire by purchase or otherwise any property in the United Kingdom or elsewhere; as builders and contractors, painters and plumbers, house furnishers, electrical and mechanical engineers, general stone merchants, brick, tile and terra-cotta manufacturers, &c. Capital £5,000 in £1 shares.

W. J. Watts & Co., Ltd.

Registered to acquire the business of brick-makers as now carried on at the brickfields, Eastwood, Essex, known as Slough House Field, and to carry on the general business of brick, tile and terra-cotta manufacturers, &c. Capital £1,000 in £1 shares.

Farrall Incandescent Light Syndicate, Ltd.

Registered to carry on the businesses of manufacturers, contractors, importers and exporters, electricians and electrical engineers, manufacturers of wires, cables, lamps, accumulators and other apparatus; as engineers and metal founders, &c. Capital £10,000 in £1 shares. Registered office: 22, Chancery Lane.

Builders' Notes.

New L.C.C. Works Manager.—Mr. George Hay, Mr. G. W. Humphreys and Mr. A. Robertson are submitted out of 150 applicants for the position of manager of works under the London County Council. The salary is to be £1,200 a year.

The Gloucester and District Master-Builders' Association held its annual general meeting recently. The balance-sheet, showing a good balance in hand, and the report were passed and adopted. Mr. G. O. Estcourt and Mr. William Jones, junr., were re-elected president and vice-president respectively, and Mr. Frederick White, Zetland Chambers, was again appointed secretary. A slight alteration in the working hours for the winter months—provisionally agreed on at a joint conference of masters and men recently held—was agreed to.

The London County Council Works Department in its return of works completed during the half year ended March 31st last states that the nett result of the execution of the thirteen works included in the statement estimated to cost £123,156 is a balance of cost below final estimate of £7,339, equal to nearly 6 per cent. Five works executed under the supervision of the architect show a total saving of £1,451 (3½ per cent.) upon final estimates amounting to £42,787; seven works executed under the supervision of the engineer show a total saving of £6,031 (7½ per cent.) upon final estimates amounting to £78,859, while the result of the one work executed under the asylums engineer shows an excess of £143 (9½ per cent.) over the final estimate of £1,509. The results of the execution of jobbing works during a part of the year 1901-2 show a balance of cost below schedule value of £823.

London County Council.—At last week's meeting of the Council the Housing of the Working Classes Committee submitted an estimate of £29,098 for the erection of Thackeray, Dickens and Coram Street buildings, to accommodate 680 persons displaced by the Holborn to Strand improvement. The plans provided for forty tenements of three rooms each, 100 of two rooms and twenty of one room. The Works Committee were unable to undertake the work at the architect's estimate, and the committee had, therefore, invited tenders. They recommended that the estimate be approved. The Finance Committee reported that an annual surplus of £73 was expected to result from the erection of the buildings, after writing down the cost of the land (£41,880) to its value as a site for working-class dwellings (£7,000). The estimate was approved.—It was decided to instruct the Special Committee on New Offices to bring up a report to the council at the earliest possible date as to a site for a county hall.

COMING EVENTS.

Wednesday, July 2.

BUILDERS' FOREMEN'S AND CLERKS OF WORKS' INSTITUTION.—Ordinary Meeting, 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual General Meeting at 8 p.m. Presentation of Prizes, and election of office-bearers for ensuing Session.

CORPORATION REFORM SOCIETY.—General Meeting at the Royal Institute of British Architects, 9, Conduit Street, W., at 7 p.m.

ROYAL ARCHEOLOGICAL INSTITUTE.—General Meeting at 20, Hanover Square, W., at 4 p.m. Mr. Philip Norman on "Exchequer Tallies" and Prof. B. Lewis on "Roman Arches at Susa and Aosta."

Thursday, July 3.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mrs. Philip H. Newman on "Some Chateaux on the Louvre."

Saturday, July 5.

NORTHERN ARCHITECTURAL ASSOCIATION.—Annual Excursion to Brinkburn Priory, Orsgrave, Rothbury Church and Morpeth.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Excursion to Carlisle and Lanercost.

Wednesday, July 9.

SOCIETY OF ARTS.—Annual General Meeting at 4 p.m.

Friday, July 11.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Excursion Meeting at Bishop Auckland to inspect the Electrical Pumping and Coal-cutting Plant at South Durham Co. hery.

Saturday, July 12.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
July 3	Port Talbot, Wales—Chapel	Hebron Welsh Congregational Church ..	Rev. D. Jones, Congregational Minister, Cymmer, Port Talbot.
3	Yardley, Worcs—Bridge	County Council	J. H. Garret, County Road Surveyor, Shire Hall, Worcester.
3	Purton, Wilts—Alterations to Workhouse	Urban Guardians	R. J. Beswick, 35 Regent Street, Swindon.
3	Woolwich—Twenty-five Houses	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
3	Craigellachie, Scotland—Mission Church	Forsters, Bishop Middleham Brewery, Ltd ..	J. Alcock, Surveyor, Keith.
3	Ferryhill, Durham—Mineral-Water Factory & Cellars	Building Club	S. Wilkinson, Architect, Pelton, near Chester-le-Street.
3	Gillingham, Kent—Forty-eight Houses	Stepney Borough Council	E. J. Hammond, 111 High Street, New Brompton.
3	Hengoed, Wales—Twenty Houses	School Board	P. V. Jones, Architect, Hengoed.
3	London, E.—Alterations to Mortuary	Stenney Borough Council	N. W. Jameson, 15 Great Alie Street, Whitechapel, E.
3	Muirkirk, Scotland—School Extensions, &c.	Midland Railway Co.	J. & H. V. Eaglesham, Architects, Wellington Chambers, Ayr.
3	London, E.—Alterations to Mortuary	Technical College Governors	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
4	Gwys—Station Buildings	Metropolitan Railway Co.	Engineer, Derby Station.
4	Worcester—Police Station	Llantrisant School Board	H. Rowe, Worcester Chambers, Pierpoint Street, Worcester.
4	Giffach Goch, Wales—Extension of Schools	Admiralty	J. Rees, Architect, Pentre, rhondda.
4	Bradwell, near Southminster—Coast Guard Buildings	Urban District Council	Director, Works Department, Admiralty, Northumberland Av., W.O.
4	Bexley Heath, Kent—Electric Generating Station	Rural District Council	Mordey & Dawbarn, 82 Victoria Street, Westminster.
4	Clonakilty, Ireland—Labourers' Cottages	School Board	W. H. Spiller, Clerk, Council Offices, Clonakilty.
5	Swindon—School	Metropolitan Railway Co.	W. Seaton, Clerk, Town Hall, Swindon.
5	Glasgow—College Buildings	Town Council	H. F. Stockdale, 38 Bath Street, Glasgow.
5	Neasden—Electrical Power House	J. Groves & Sons	Secretary, 32 Westbourne Terrace, Paddington, W.
5	North Ashton—Enlargement, &c., of Schools	Urban District Council	J. W. Liversedge, Architect, Wigan Road, Ashton-in-Makerfield.
5	Axbridge, Somerset—Infants' Room and Cloakroom	Dock Committee	Rev. H. Toft, Axbridge Rectory.
5	Bristol—Extension of Offices	Guardians	W. V. Gough, 22 Bridge Street, Bristol.
5	Christchurch, Hants—Pigstyes	Agricultural Society	A. Druitt, Clerk, Christchurch.
5	Cockermouth—Works at Nursing Home	Metropolitan Railway Co.	T. Houghton, Treasurer, York City & County Bank, Cockermouth.
5	Lyde, Cheshire—Shedding, Canvas, &c., at Exhibition	Town Council	T. A. Beckett, Secretary, St. Werburgh Chambers, Chester.
5	London, N.W.—Electrical Power House	J. Groves & Sons	Secretary, 32 Westbourne Terrace, Paddington, W.
5	Oswestry—Extensions to Market Buildings	Urban District Council	G. W. Lacey, Borough Surveyor, Guildhall, Oswestry.
5	St. Erney, Cornwall—Renovating Church Tower, &c.	Parish School Board	O. O. Steed, Trewith, Landrake.
5	Bilingshurst, Sussex—Post Office, &c.	Market Hall Committee	O. H. Burdett, 6 West Street, Horsham.
5	Bridport, Dorset—Hotel Additions, &c.	Billington and Whalley Co-operative Soc. ..	F. Cooper, Architect, Bridport.
7	Colwyn Bay—Boundary Walls, Excavations, &c., at Cemetery	Blakey Moor Co-operative Society, Ltd. ..	W. Jones, Engineer, Council Offices, Colwyn Bay.
7	Alloa, Scotland—School	Rural District Council	T. Frame & Son, 43 Mill Street, Alloa.
7	Coventry—Market roof	Cottage Hospital Trustees	J. E. Swindlenhurst, City Surveyor, St. Mary's Hall, Coventry.
7	Langho, Lancs—Eight Houses	Rural District Council	Simpson & Duckworth, Architects, Richmond Chambers, Blackburn.
7	Blackburn—Shop and Six Houses	Bronzehoag Building Club	Simpson & Duckworth, Architects, Richmond Chambers, Blackburn.
7	Stranorlar, Ireland—Two Cottages	Lancs County Council	G. McLaughlin, Clerk, Board Room, Workhouse, Stranorlar.
7	Coventry—Bedroom and Alterations to Hospital	King's Norton Guardians	H. W. Chatterway, Architect, Trinity Churchyard, Coventry.
7	Larne—Hospital Buildings	County Council	N. Fitzsimons, 82 Royal Avenue, Belfast.
7	South Stoneham—Engine-house, Cottages, &c.	Urban District Council	Bailey, Denton, Lawford & Symons, Palace Chhrs., Westminster.
7	Pendyarn, Wales—Sixty Workmen's Cottages	Charity Trustees	T. Roderick, Architect, Merthyr.
8	Preston, Lancs—Rebuilding Bridge	Urban District Council	County Bridgmaster, Preston.
8	Selly Oak, Birmingham—Workhouse Mortuary, &c.	R. H. Lee & Co.	Whitwell & Son, Temple Row, Birmingham.
8	Appley, Lancashire—Rebuilding Bridge	Bolckow, Vaughan & Co.	W. O. Hall, County Bridgmaster, County Offices, Preston.
8	Cheshunt—Twelve Workmen's Cottages	J. Gittins	A. C. Lee, Clerk, Manor House, Cheshunt.
9	Fosdyke—Pair of Cottages	Union Guardians	J. Kirkby, Fosdyke.
10	Gillingham, Kent—Corrugated Iron Buildings	Union Guardians	F. O. Boucher, Clerk, Gardiner Street, New Brompton.
10	St. Austell, Cornwall—Alterations, &c., to Premises	Bank of Liverpool, Ltd.	T. H. Andrew, 1 Trevarrick Villas, St. Austell.
10	Bishop Auckland, Durham—200 Workmen's Houses	Town Council	I. A. Derwent, 19 Danesbury Terrace, Partington.
10	Birkenhead—Sunday School	Dispensary Committee	Walker & Collinson, Architects, Swan Arcade, Bradford.
11	Dolton, near Cemmaes Station—Farmhouse	North-Eastern Railway Co.	R. L. Jones, Architect, Mount Place, Bala.
11	Newcastle-on-Tyne—Alterations at Elswick Grange	Metropolitan Asylums Board	Oliver, Leeson & Wood, Architects, Mosley Street, Newcastle.
11	Newcastle-on-Tyne—Alterations to Hospital Ward	St. Pancras Guardians	Newcombe & Newcombe, 89 Pilgrim Street, Newcastle-on-Tyne.
12	Milom, Cumberland—Bank Premises	School Board	J. E. Curwen, 26 Highgate, Kendal.
12	Boston—Municipal Buildings	Corporation	J. Rowell, Architect, Borough Offices, Market Place, Boston.
15	Shillingstone, Dorset—Reconstructing Bridge	Worcester County Council	County Surveyor, Wimbome.
15	Halton—Parish Institute	Dock & Warehouse Extension Co., Ltd. ..	Bedford & Kitson, Architects, Greek Street Chambers, Leeds.
16	Leeds—Premises	Chorlton Guardians	Bedford & Kitson, Architects, Greek Street Chambers, Leeds.
16	York—General Offices	Urban District Council	W. Bell, Company's Architect, York.
16	Leeds—Premises	Industrial Society, Limited	Bedford & Kitson, Greek Street Chambers, Leeds.
16	Carshalton, Surrey—Convalescent Hospital	Harbour Commissioners	Treadwell & Martin, 2 Waterloo Place, Pall Mall, S.W.
17	London, N.W.—Coach-house and Stabling	Gas and Water Company	A. E. Pridmore, 2 Broad Street Buildings, E.C.
17	Falmouth—Classroom	Parish Council	W. Jenkins, 39 Church Street, Falmouth.
17	Falmouth—Classroom	Northumberland County Council	
ENGINEERING:			
July 3	Manchester—Steam Piping	Corporation	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
3	Yarley—Rebuilding Bridge	Worcester County Council	J. H. Garret, County Road Surveyor, Shirehall, Worcester.
3	Manchester—Dock Works, &c.	Dock & Warehouse Extension Co., Ltd. ..	W. H. Hunter, 41 Spring Gardens, Manchester.
3	Whittington—Fuel Economiser	Chorlton Guardians	Manchester Steam Users' Association, 9 Mount Street, City.
4	Bexley Heath, Kent—Steelwork for Electric Station	Urban District Council	Mordey & Dawbarn, 82 Victoria Street, Westminster.
4	Willington Quay—Electrical Equipment	Industrial Society, Limited	Secretary, Society's Offices, Bewick Road, Willington Quay.
4	Aberdeen—Steel Swingbridge and Machinery	Gas and Water Company	R. G. Nichol, Engineer, Aberdeen.
4	Caepriny—Reservoir	Parish Council	T. Rees, Engineer, Corn Exchange Chambers, Newport, Mon.
4	Meommsley—Electric Lamp Poles, &c.	Northumberland County Council	M. T. Milburn, Clerk, Jubilee Houses, Meommsley.
4	Newcastle-on-Tyne—Bridge Works	Corporation	J. A. Bean, County Surveyor, Moorhall, Newcastle-on-Tyne.
4	Ipswich—Electric Lighting Plant	Corporation	W. Bantoft, Town Clerk, Town Hall, Ipswich.
6	Llanoddeilan, Wales—Lamp Posts for Street	Norwegian State Telegraph Department ..	Technical Department of the Board of Telegraphs, Christiania.
7	Norway—Telephone Cable	County Council	Warren & Stuart, 94 Hope Street, Glasgow.
7	Railkirk—Waterworks	Parish Council	W. Arnot, 79 West Regent Street, Glasgow.
7	Glasgow—Coal and Ash Conveyors, &c.	Rural District Council	A. P. I. Cotterell, 25 Balawin Street, Bristol.
7	Winanton—Waterworks	Lord Provost, Magistrates and Council ..	Engineer, Electricity Supply Station, Dewar Place, Edinburgh.
7	Edinburgh—Electric Lighting	Harbour Commissioners	G. F. L. Gies, Harbour Engineer, Harbour Office, Belfast.
7	Beifast—Ferry Boat	Corporation	I. M. Jones, City Surveyor, Town Hall, Chester.
7	Chester—Electric Tramways	Tramways and Electricity Board	F. Schofield, Clerk, Town Hall, Stalybridge.
7	Stalybridge—Electrician Plant	Urban District Council	Mordey & Dawbarn, 82 Victoria Street, Westminster, S.W.
7	Bexley Heath—Points and Crossings, &c.	Rural District Council	Bailey, Denton, son, Lawford & Symons, Palace Chhrs., Westminster.
7	South Stoneham—Sewerage Works	Corporation	Borough Engineer, Derby.
7	Derby—Electric Tramways	North-Eastern Railway Co.	W. J. Oudworth, Company's Engineer, York.
7	Staddlethorpe—Widening Railway	London County Council	County Hall, Spring Gardens, S.W.
8	London, S.W.—Steam Piping, &c.	Corporation	J. K. Bock, Borough Electrical Engineer, Abbey Mills, West Ham.
8	West Ham—Electric Trams	Urban District Council	H. P. Linton, Clerk, Town Hall, Mountain Ash.
8	Mountain Ash, Wales—Street-Sweeping Machine, &c.	Wardle Urban District Council	T. Burrows, Surveyor, Council Offices, Wardle.
8	Smallbridge, Lancs—Altering Sewage Tanks, &c.	Corporation	J. F. O. Snel, Borough Electrical Engnr., Town Hall, Sunderland.
9	Sunderland—Electric Tramway	Rural District Council	Besley, Son & Nichols, 11 Victoria Street, Westminster.
9	Epsom, Surrey—Bacteria Beds	Urban District Council	W. Green, Surveyor, Council Offices, Castleford.
10	Castletown—Main Laying	Bransford Rural District Council	J. Oare, Engineer, Sleaford.
10	Fotherhamworth, Lancs—Water Supply Works	Rural District Council	A. H. Lapham, Surveyor, Yornham.
10	Chippenhams—2 Steam Rollers	Urban District Council	G. H. Sammons, Clerk, Elmfield House, Teddington.
10	Teddington—Electric Lighting Scheme	City Council	W. O. C. Hawtayne, 9 Queen Street Place, London, E.C.
12	Leeds—Tramways	Corporation	Sir J. W. Barry & Partners, 21 Deane Street, Westminster.
14	Leicester—Steel Arch Bridge over River	Gas and Electric Lighting Committee ..	Burkall & Monkhouse, 14 Old Queen Street, Westminster, S.W.
14	Railkirk—Electric Plant	Urban District Council	A. Colson, Engineer, Offices, Milsome Lane, Leicester.
14	Leicester—Gasholder	London County Council	J. T. Wood, 3 Cook Street, Liverpool.
15	Skeimssdæle—Borehole, Deepening Well, &c.	London County Council	County Hall, Spring Gardens, S.W.
15	London, S.W.—Electric Cranes	London County Council	County Hall, Spring Gardens, S.W.
15	London, S.W.—Cable Ducts	London County Council	County Hall, Spring Gardens, S.W.
15	London, S.W.—Electric Trams	London County Council	County Hall, Spring Gardens, S.W.
16	Bombay—Providing and Laying Steel Mains	Corporation	Executive Engineer, Bombay.
16	Cheltenham—Waterworks	Metropolitan Asylums Board	J. Hall, Waterworks Engineer, Municipal Offices, Cheltenham.
16	Dartford—Laundry Plant	Urban District Council	I. D. Mann, Clerk, Board's Offices, Embankment, E.C.
17	Gillingham, Kent—Electric Plant	Urban District Council	W. H. Trenham, 39 Victoria Street, Westminster, S.W.
18	Epsom—Electric Plant	Urban District Council	E. G. Wilson, Clerk, Council Offices, Epsom.
20	Southborough, Kent—Pumping Station	Urban District Council	G. & F. W. Houson, Engineers, Loughborough.
31	Ramsgate—Sea-Defence works	Corporation	T. O. Taylor, Borough Surveyor, Aldion House, Ramsgate.
31	London, S.W.—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
ENGINEERING—cont.:			
Sept. 1	Valparaiso, Chile—Electric Tramways	-----	Chilian Consulate, 10 Lime Street, E.C.
" 14	St. Petersburg, Russia—2 Bridges over River Neva ..	-----	The Delegation Municipale, St. Petersburg.
" 15	Launceston, Tasmania—Electric Power Transmission Extensions.	Mayor and Aldermen	J. Terry & Co., 7 Great Winchester Street, E.C.
" 30	Port Adelaide, South Australia—Harbour	-----	Agent-General for South Australia, 1 Crosby Square, London.
IRON AND STEEL			
July 3	Manchester—Cast-iron Pipes	Gas Committee	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
" 3	London, E.C.—Steel Rails, &c.	Mexican Railway Co., Ltd.	J. F. Denniston, 45 New Broad Street, E.C.
" 3	Bethnal Green—Cast-iron Manholes and Dust Pails ..	Borough Council	Chief Inspector, Public Health Dept., Town Hall, Bethnal Green.
" 4	Bexley Heath, Kent—Steelwork for Elec. Gen. Station	Urban District Council	Morley & Dawbarn, 82 Victoria Street, Westminster.
" 5	Glasgow—Wright Work for College Buildings	Technical College Governors	H. F. Stockdale, 28 Bath Street, Glasgow.
" 10	Newcastle-on-Tyne—Tramway Rails, &c.	Corporation	City Engineer, Town Hall, Newcastle-on-Tyne.
" 16	Cheltenham—Cast-iron Water Main	Corporation	J. Hall, Waterworks Engineer, Municipal Offices, Cheltenham.
" 21	Chertsey—Cast-iron Pipes, &c.	Urban District Council	W. H. Radford, Albion Chambers, King Street, Nottingham.
PAINTING AND PLUMBING			
July 3	Bishop Auckland—Painting Railways, &c.	-----	G. Ross, Cemetery Superintendent, Bishop Auckland.
" 3	Bury, Lancs—Painting and Decorating Chapel	-----	Caretaker, Woolford Wesleyan Chapel, Bury.
" 3	Tudhoe, Durham—Painting and Colouring Schools ..	School Board	S. Adams, Olerk, Bishop Auckland.
" 3	Whiston, Prescot—Cleaning and Painting Infirmary ..	Prescot Union Guardians	J. Gandy, Architect, St. Helens.
" 4	St. Pancras, London—Cleaning and Painting	Midland Railway Co.	Engineer, Derby Station.
" 4	Hull—Cleaning and Distemping at Workhouse	Seacoates Union Guardians	T. B. Atkinson, 11 Trinity House Lane, Hull.
" 5	Macclesfield—Painting, &c., Chapels and Lodges ..	Cemetery Committee	A. T. Pattinson, Town Olerk, Macclesfield.
" 7	Aberkneigh—Painting, Colouring & Decorating Chapel	-----	J. & F. J. Hurley, 10 Bridgend Road, Aberkneigh.
" 7	London, W.—Painting, &c., at Baths	Kensington Borough Council	Borough Engineer, Town Hall, Kensington High Street, W.
" 8	Norwich—Painting, &c., at Schools	School Board	O. J. Brown, Architect, Cathedral Offices, Norwich.
ROADS AND CARTAGE			
July 3	Wanstead, Essex—Stone	Urban District Council	W. Blewitt, Clerk, Council Offices, Wanstead, N.E.
" 3	Midhurst, Sussex—Steam Road Roller	Urban District Council	A. G. Gibbs, Surveyor, Council Offices, Midhurst.
" 3	Wanstead—Steam Roller, &c.	Urban District Council	C. H. Bressey, Surveyor, Council Offices, Wanstead, N.E.
" 3	Pentre, Glamorgan—Road Works, &c.	Rhondda Urban District Council	Surveyor, Council Offices, Pentre, Glamorgan.
" 4	Branksome, Dorset—Granite	Urban District Council	S. J. Newman, Surveyor, Council Offices, Branksome.
" 5	Teddington—Road Works, &c.	Urban District Council	M. Hainsworth, Surveyor, Elmfield House, Teddington.
" 5	Midhurst—Hire of Steam Road-Roller	Rural District Council	A. G. Gibbs, Surveyor, Council Offices, Midhurst.
" 8	Southampton—Paving Stone	Corporation	J. A. Crowther, Borough Engineer, Municipal Offices, Southampton.
" 9	Wembley, Middlesex—Making-up	Urban District Council	A. R. W. Chapman, Surveyor, Public Offices, Wembley.
" 10	Gillingham, Kent—Kerbing, &c.	Urban District Council	F. O. Boucher, Clerk, Gardiner Street, New Brompton.
" 10	Gillingham, Kent—Materials	Urban District Council	F. O. Boucher, Clerk, Gardiner Street, New Brompton.
" 12	Halesworth, Suffolk—Pavement, &c.	Urban District Council	C. H. White, Clerk, Halesworth.
" 16	Rochester—Materials	Corporation	W. Banks, City Surveyor, Rochester.
Aug. 6	Epsom—Making-up	Rural District Council	T. E. Ware, Surveyor, Waterloo Road, Epsom.
SANITARY:			
July 3	Blaydon-on-Tyne—Scavenging	Urban District Council	R. Biggins, Sanitary Inspector, Blaydon-on-Tyne.
" 3	Bolsover—Cleansing Ashpits, &c.	Urban District Council	H. Bell, Inspector of Nuisances, Bolsover.
" 4	Brighton—Drain Pipes	Town Council	F. J. O. May, Borough Surveyor, Town Hall, Brighton.
" 4	Uelbridge—Workhouse Sewerage System, &c.	Union Guardians	F. Shortt, Clerk, Workhouse, Uelbridge.
" 7	Harpley, King's Lynn—Sewer	Freebridge Lynn R.D.O.	W. Cross, Clerk, King's Lynn.
" 7	Nuneaton—Sewers, &c.	Urban District Council	J. S. Pickering, Engineer, Council Offices, Nuneaton.
" 7	Sheffield—Lime	United Gas Light Co.	H. Thomas, General Manager, Commercial Street, Sheffield.
" 7	South stonham—Sewerage Works	Rural District Council	Bailey, Denton, Son, Lawford & Symons, Palace Chmoss, Westminster.
" 8	Westlake, near Dudley—Settling Tank and Drain ..	Urban District Council	J. Dinsdale, Council's Surveyor, Dudley.
" 9	Epsom, Surrey—Bacteria Beds	Rural District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster.
" 10	London, S.W.—Reconstructing Drainage, &c.	Southwark Union Guardians	G. D. Stevenson, 13 & 14 King Street, Chapside, E.C.
" 10	Surbiton—Stoneware Pipe Storm-water Drains	Urban District Council	F. J. Bell, Deputy Clerk, Ewell Road, Surbiton.
" 12	Runcorn—Sewerage Works	Rural District Council	W. H. Radford, Engineer, Albion Chambers, Nottingham.
" 12	Penistone, Yorks—Sewerage Works	Rural District Council	W. Spinks, 20 Park Row, Leeds.
" 18	Thrupp, near Stroud—Sewers	Stroud Rural District Council	O. S. Cole, Resident Engineer, Bridge House, Ebley, Stroud.
" 21	Chertsey—Sewerage Works (Two Contracts)	Urban District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster.
" 21	Chertsey—Sewerage & Sewage-Disposal Works	Urban District Council	W. H. Radford, Engineer, Albion Chambers, King St., Nottingham.
" 21	Darfield, Yorks—Sewerage Works	Urban District Council	Fairbank & Son, 13 Lendal, York.
TIMBER:			
July 5	North Walsham—Wood Block Floors	School Board	Bottle & Olley, 5 Queen Street, Great Yarmouth.

COMPETITIONS OPEN.

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July 19	Aylesbury—Monument	-----	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
" 26	Clacton-on-Sea—Board School	-----	C. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices ..	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-15	St. Petersburg—Bridges over Great Neva River	-----	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	-----	C. H. J. Talmage, Southend-on-Sea, Warnor Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c. ..	£200, £100, £50.	W. H. Prescott, Engineer, U.D.C. Offices, Tottenham.
Nov. 1	Alahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Alahabad, India.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABERAVON.—For the construction of an iron girder bridge over the River Avon at Sandfields, for the Town Council:—

Contract No. 1.—Masonry.

Barnes, Chaplin & Co., Cardiff £6,224 11 7
A. A. S. Frazier, Cardiff 5,721 11 2
Clarke & Co., Connaught Road, Cardiff 5,383 9 6

Contract No. 2.—Iron and steel.

Rees & Kirby, Morriston, Swansea 4,101 3 2
W. Bretell, Worcester 4,049 0 8
Darlington Wagon & Engineering Company, Darlington 3,865 0 0
J. Westwood & Co., London 3,840 0 0
W. Worthington, Birmingham 3,220 0 0
A. A. S. Frazier 3,167 15 8
Gilbert, Thompson & Co., Victoria Buildings, Birmingham 3,068 10 6
* Accepted.

CATFORD.—For the erection of a baptist church in the Brown-hill Road. Messrs. Smee, Mence & Houchin, architects, 12 West

Smithfield, E.C. Quantities by Mr. A. Goodchild, 81 Finsbury Pavement, E.C.:

Holliday & Greenwood £6,877
J. V. Kiddle & Son 6,700
Higgs & Hill, Ltd. 6,680
C. Castle & Son 6,480
Campbell, Smith & Co. 6,400
James Smith & Sons, Ltd. £6,390
Battley, Sons & Hoiness .. 6,147
J. Greenwood 6,137
Jerrard & Sons 5,879
* Accepted.

DUDLEY.—For the erection of boiler-house and laundry at the workhouse, for the Guardians. Mr. A. Marshall, architect, King Street, Nottingham:—

Willcock & Co., Wolverhampton £10,450
W. Hopkins, Birmingham 9,507
Hanley & Son, Smethwick 9,507
H. Dorre, Cradley Heath 9,492
Fish & Sons, Nottingham 9,480
L. Jones, Wolverhampton 9,480
W. H. Gibbs, King's Heath 9,380
L. Mallin, West Bromwich 9,290
W. Crane, Nottingham 9,182
M. Round, Dudley 9,179
J. Dallow, Birmingham 9,125
J. Guest, Stourbridge 9,100
Windsor & Co., London 8,969
R. M. Hughes, Birmingham 8,968
J. H. Vickers, Nottingham 8,969
Whitehouse & Sons, Birmingham 8,968
Oakley & Coulson, Dudley 8,960
A. C. Hughes, Birmingham 8,960

EPING (ESSEX).—For the erection of school buildings, St. John's Road, for the School Board. Messrs. Harrington & Ley, architects, 66 Bishopsgate Street Without, E.C.:

Stephens & Bastow £4,282 0
General Builders, Ltd. 4,229 0
Thomas & Edge 4,217 0
Smith & Son 4,195 0
Wilson & Lamplough 4,163 0
Chessum & Sons 3,963 0
Wells & Son 3,950 0
Hawkins & Son 3,943 18
A. W. Robins 3,930 0
Oak Building Co. 3,902 0
Foster & Son £3,901 0
Hawkey & Oldman 3,820 0
A. Knight 3,812 0
Foster Bros. 3,749 0
B. E. Nightingale 3,748 0
Hammond & Son 3,724 0
Keen & Sons 3,320 0
E. West, Chelmsford 3,592 0
Sims & Wood 3,582 0
* Accepted provisionally.

GAISGILL (WESTMORLAND).—For the erection of a bridge over the River Lune, near Gaisgill. Mr. Joseph Bintley, county surveyor, 7 Lowther Street, Kendal:—

Whittaker Bros., Ltd., Horsforth, near Leeds £2,770 0 0
W. Thoms, Kendal 2,625 8 0
T. Thoms & Sons, Brunton Street, Lancaster .. 2,555 10 0
W. Grisenthwaite, Penrith 2,142 1 7
* Accepted subject to modifications reducing the contract amount to £1,901 6s. 6d.

HEANOR.—For the erection of factory buildings, for Messrs. J. N. Fletcher and Sons. Mr. A. Marshall, architect, King Street, Nottingham:—

Dickenson £10,038
F. Messom 9,706
T. Barlow 9,702
Dennett & Inglis 9,450
Crane & Co. 9,244
J. Woodend 9,085
Fish & Sons 8,835
J. Wright 8,820
H. Vickers £8,705
Warner 8,662
Windsor & Co. 8,589
Cooper & Son 8,350
Vickers & Co. 8,270
J. H. Williamson, Nottingham 8,109
* Accepted.

TENDERS—cont.

HURLINGHAM, S.W.—Accepted for the erection of Hurlingham Court Mansions, for D'Eresby House, Ltd., including roof garden. Messrs. Palgrave & Co., architects, Westminster.—
Mead & Burton, Chesham £28,845

ILFORD—For the erection of a pair of shops in High Road, Ilford. Mr. Fredk. G. Faunch, architect, 9 Cranbrook Gardens, Ilford.—
Simms & Woods, London, W.C. £1,300 0
G. Lewin, Ilford 1,000 0
Hammond & Miles, * Ilford 1,080 0
* Accepted.

ILFORD—For the erection of a pair of villas in Coventry Road, Ilford. Mr. Fredk. G. Faunch, architect, 9 Cranbrook Gardens, Ilford.—
R. G. Walter, Barkingside £1,325
G. Lewin, Ilford 1,224
C. North, Stratford 1,167
Simms & Woods, London, W.C. 1,150
* Accepted.

KILLARNEY—For the erection of a house in York Road, Killarney. Mr. O. I. Edwards, architect, Frome.—
P. Murphy, Tralee £1,550 18 0
D. Creedon, Ferny, co. Cork 1,180 0 14
T. Gallivan, New Street, Killarney 1,065 12 2
Note.—No tender accepted, as the lowest exceeded the limit allowed the architect by a very considerable sum. The house is now being erected by the architect at his original estimate.

LEICESTER—For the construction of new sewers and street formation with the necessary manholes, lampholes, and other works in connection therewith, for the Estate and Burial Grounds Committee of the Leicester Corporation. Mr. E. Geo. Mawbey, M.I.C.E., borough engineer.—
E. W. Barker, Harrogate £1,020 6 5
J. Holme 1,150 19 2
Stimpson & Rollston 1,149 7 4
H. Mason 1,144 18 10
Hutchinson & Son 1,048 11 0
T. Philbrick 1,047 18 4
J. H. Snedley, * Baitenbury Road 1,068 16 4
[Rest of Leicester.] * Accepted.

LITHERLAND (LANCS.)—For the completion of Hartwell Street, Bowden Street, and Tattersall Road, for the Urban District Council. Mr. A. H. Carter, surveyor.—
R. Chadwick, Liverpool £2,133 13 1
T. Rowlands, Northwich 1,065 10 0
P. Tyson, Liverpool 1,050 0 0
J. Joynton, Walton 1,880 18 3
Keating & Sons, Liverpool 1,770 12 9
W. Owen & Co., * Litherland 1,120 1 9
* Accepted.

LONDON, E.—For the erection of a factory, London Road, Plaistow, for Messrs. H. Wheeler & Co. Mr. A. J. Wade, architect, 36 Fifth Avenue, Harrow Road.—
W. M. Norton £3,295
G. J. Hosking 3,027
A. Daniels 2,890
J. Groves 2,698
J. W. Jerram 2,608
[Architect's estimate, £2,500.]
* Accepted with basement added at £2,600.

LONDON, E.C.—For the construction of about 470 ft. run of brick and concrete egg-shaped sewer in Worship Street, for the Finsbury Borough Council.—
Mowlem & Co., Westminster, S.W. £1,816
Williamson & Sons, Green Lanes, N. 1,510
G. Bell, Tottenham Hale 1,450
T. W. Pedrette, Stamford Hill 1,457
Killingback & Co., Camden Town 1,394
J. A. Dunmore, Crouch End 1,365
J. G. Fulham 1,291
T. Adams, * Wood Green 1,180
* Accepted.

LONDON, S.W.—For the erection on their premises of the following buildings, for the Fulham Board of Guardians: (Contract No. VIII.) engine and accumulator rooms, boiler settings, and flue work, &c.—
W. Neil & Co., Bow, E. £2,632 10 0
Miles & Warner, Stalybridge 2,518 11 8
W. Gilbert, Stamford Hill 2,518 9 8
J. Smith & Sons, Ltd., South Norwood 2,287 0 0
B. E. Nightingale, Lambeth 2,208 0 0
Wilson & Lamplough, Kensal Rise 2,180 0 0
F. G. Minter, Westminster 2,170 0 0
W. J. Renshaw, Putney 2,040 0 0
J. O. Richardson, Peckham 1,942 0 0
H. Windsor & Co., Clapham Junction 1,493 7 11
T. G. Sharplington, Macehill Road Works, Nunhead 1,805 0 0
* Accepted subject to a satisfactory report from the engineer.

LONDON, N.—For the erection of schools, Montague Road and Houndsfield Road, for the Edmonton School Board. Mr. H. W. Dobb, architect, 99 Church Street, Lower Edmonton.—
Montague Road School.
Barker & Co., * £2,550 0 0
Spencer, Santo & Co., 27,010 0 0
Patrick 26,130 0 0
Saint 25,911 0 0
Willmott 25,500 0 0

Appley 25,820 0 0
McCormack & Son 24,786 0 0
Hockley & Co. 24,750 0 0
Stephens, Bastow & Co. 24,047 0 0
Wall & Co. 24,365 0 0
Nightingale 24,441 0 0
Lawrence & Sons 24,353 0 0
Stimpson & Co. 24,313 0 0
Deering & Son 24,275 0 0
Shillitoe & Son 24,000 0 0
Tonge 23,851 0 0
Lawrence & Son 23,813 0 0
Wisdom 23,711 1 10
Knight & Son 23,389 0 0
Johnson & Co., Wandsworth 22,070 0 0
Porter & Son 22,062 0 0
Oak Building Company, Cambridge* 22,820 0 0
[Architect's estimate, £23,103.]

Houndsfield Road School.
Barker & Co. £20,600 0 0
Spencer, Santo & Co. 20,562 0 0
Willmott 20,480 0 0
Saint 24,788 0 0
Appley 21,460 0 0
Patrick 24,500 0 0
Hockley & Co. 23,550 0 0
McCormack & Son 23,450 0 0
Stephens, Bastow & Co. 23,222 0 0
Nightingale 23,197 0 0
Wall & Co. 22,902 0 0
Lawrence & Sons 22,074 0 0
Stimpson & Co. 22,022 0 0
Shillitoe & Son 22,000 0 0
Deering & Son 22,861 0 0
Tonge 22,500 0 0
Wisdom 22,448 0 0
Lawrence & Son 21,980 0 0
Knight & Son 21,987 0 0
Oak Building Co. 21,780 0 0
Porter & Son 21,071 0 0
Johnson & Co. 21,410 0 0
[Architect's estimate, £23,810.]

* Accepted subject to the approval of the Board of Education.

LONDON—For the erection of a chapel at Thane Villas, Seven Sisters Road, N. Messrs. Smee, Mence & Houchin, architects, 12 West Smithfield, E.C. Quantities by Mr. A. Goodchild, 81 Finsbury Pavement, E.C.—
Simms & Wood £1,134 10 2
Miskin & Sons 3,800 0 0
Patman & Fotheringham 3,710 0 0
McCormick & Sons 3,548 0 0
Turtie & Appleton 3,037 0 0
J. Smith & Sons, Ltd. 3,014 0 0
Campbell, Smith & Co. 3,587 0 0
Lawrence & Sons* 3,584 0 0
Battley, Sons & Holness
Accepted.

LONDON, W.C.—For the erection of new premises, 62 to 65 Charing Cross, for the Canadian Pacific Railway Company. Mr. G. Richards Julian, architect. Quantities by Messrs. Fowler & Hugman.—
Foster & Dicksee £18,884
H. Line 18,290
Harris & Wardrop 18,147
Treasure & Son 18,180
J. Williams 17,987
Patman & Fotheringham 17,920
Lovatt 17,550
Maple & Co., Ltd. £17,491
W. Brown 17,400
G. H. & A. Bywaters & Sons 17,360
J. Carmichael 17,363
Holloway Bros. 17,249
Grover & Sons 17,071
Patrick & Son 17,061

MAYFIELD (SUSSEX)—Accepted for the erection of an infirmary at the Convent, Mayfield, Sussex. Mr. Charles H. Mead, architect, 8 Mortimer Street, London, W.—
Meon & Son, Rotherfield, Sussex £2,375

OXFORD—Accepted for the extension of the "New Room," at Summer Fields, Oxford, for the Rev. C. E. Williams, D.D. Mr. Herbert Quinton, architect and surveyor, 22 George Street, Oxford. Quantities by the architect.—
Money & Wild £703 10 8

OXFORD—Accepted for the erection of six new waterclosets at Summer Fields, Oxford, for the Rev. C. E. Williams, D.D. Mr. Herbert Quinton, architect and surveyor, 22 George Street, Oxford. Quantities by the architect.—
Money & Wild £225 10

PICKERING AND KIRBYMOORSIDE (YORKS.)—For laying six miles of 34 in. and 3-in. cast-iron water-mains, the construction of impounding tanks, and service reservoir, and the supply of about 210 tons of cast-iron pipes and fittings for the joint water supply of Sjaunton, Lastingham, and Appleton-le-Moors, for the Joint Committee of the Pickering and Kirbymoorside Rural District Council. Mr. J. E. Parker, A.M.I.C.E., engineer, Post Office Chambers, Newcastle-on-Tyne.—
W. Winward, Waltham, Wigan £4,172 13 8
A. Lyons Norton Malton 4,080 10 0
R. A. Crowe, Deansgate, Manchester 4,081 19 0
C. Firth, Scarborough 3,500 0 0
T. Bell, Market Weighton 3,375 14 0
F. W. Simpson, Burton Leonard, Leeds 3,245 3 3
R. W. Barker, Harrogate 3,107 0 0
J. Curriek, Crossgate, Durham 2,961 17 0
C. Bushby & Sons, * Preston, Leyburn, R.S.O. 2,927 17 0
* Accepted.

ST. ALBANS—New infants' school, Garden Fields, St. Albans, for the St. Albans School Board. Messrs. Smee, Mence & Houchin, architects, and quantity surveyors, 12 West Smithfield, London, E.C., and St. Albans, Herts.—
Miskin & Sons £1,880
E. Dunham 1,864
Whibley & Jervis* £1,781
* Accepted.

ST. ALBANS—For the erection of a congregational church at the junction of Victoria Street and Beaconsfield Road, St. Albans, Messrs. Smee, Mence & Houchin, architects, 12 West Smithfield, E.C., & 18 London Road, St. Albans. Quantities by Messrs. J. B. Colwill & Son, 6 Alma Road, St. Albans.—
Whibley & Jervis, St. Albans £8,862
Battley, Sons & Holness, London 8,600
Boff Bros., Park Street 8,450
Wilnot, Hitchin 8,360
Dunham, St. Albans 8,181
Miskin & Sons, St. Albans 8,173

AYOT ST. LAWRENCE (HERTS.)—For the erection of a new rectory for the Rev. Joseph Ray. Messrs. Smee, Mence & Houchin, architects and quantity surveyors, London, E.C., and St. Albans, Herts.—
C. Miskin & Sons £2,022
J. Francis Newton 2,488
J. Fenwick Owen 2,479
Thos. Turner, Ltd. £2,390
Goldhawk & Sons* 2,325
* Accepted.

SUDBURY (SUFFOLK)—For the construction of about 130 yards of 24-in. diameter brick sewer, and about 15,000 lined yards of stone ware and cast-iron pipe sewers, together with manholes, lampholes, flushing chambers, and other works in connection therewith, for the Drainage Committee. Mr. T. W. A. Hayward, C.E., F.S.I., borough engineer.—
Gil & West, Southend £14,637
G. Osanton, Westham 12,047
J. & T. Binns, Croydon 12,271
G. Bell, Tottenham 11,794
J. A. Dunmore, London, N. 11,785
Wilkinson Bros., London, N. 10,434
Johnson & Langley, Leicester 10,370
F. J. Coxhead, Leytons, one 9,618
Streeters & Todhunter, Godalming, Surrey 9,531
Case Sea Defence Syndicate Ltd., London, W.C. 9,387
W. Manders, * Leyton 9,378
* Accepted.

RAYLEIGH (ESSEX)—Accepted for the erection of a Wesleyan Sunday school. Messrs. Smee, Mence & Houchin, architects, 12 West Smithfield, E.C.—
J. Byford, Rayleigh £910

TOTTENHAM—For the erection of a private house. Messrs. Smee, Mence & Houchin, architects, 12 West Smithfield, E.C. Quantities by Mr. A. Goodchild, 81 Finsbury Pavement, E.C.—
Miskin & Son, St. Albans £2,800
Brown 2,750
Lawrence & Sons, London 2,684
Wade, St. Neor's, Hunts 2,583
Stewart, Tottenham 2,560
Newton 2,487
Battley, Sons & Holness, London 2,479

TORQUAY—For the erection of a new building for Rosehill Hospital.—
J. M. Kellar £2,580
J. Chubb 2,875
G. K. Smale 2,840
T. Vanstone 2,825
A. Harris 2,784
Watson 2,770
H. Goss £2,772
J. Snedgar 2,748
R. F. Yeo 2,685
W. Brenton 2,600
E. P. Bovey 2,570
S. Blatchford 2,545

WEST HAM—For the erection of mortuary, Ordnance Road, Canning Town, E., for the West Ham Town Council. Mr. John G. Morley, borough engineer.—
A. G. Sykes, Stratford £1,965 0 0
Genera. Builders, Ltd., Notting Hill, W. 1,777 0 0
Yates & Co., Bow, E. 1,680 0 0
Poster Bros., Norwood Junction 1,597 0 0
Goodman & Sons, Barnsbury 1,512 4 10
Horlock & Son, Barkings Road, E. 1,404 0 0
G. Wise, works manager, West Ham 1,435 0 0
Calman & Son, * 242 Commercial Road, E. 1,370 0 0
* Accepted.

WOOLWICH—For alterations and additions to the Royal Pavilion Hotel, Woolwich. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London. Quantities supplied.—
Osborn & Sons £4,351
F. & T. Thorne 4,329
Courtney & Fairbairn 4,250
Todd & Newman 4,217
Thomas & Edge £4,197
Green & Smith 4,196
Sheffield Bros.* 3,887
* Accepted.

LUTON—For the erection of Bury Park Congregational Church: Estimate A, church tower and one vestry; Estimate B, church parlour, vestry, heating chamber, lavatories, &c.; Estimate C, alterations to existing school.—
Estimate A. Estimate B. Estimate C.

B. E. Nightingale £4,525
C. Miskin & Sons 4,500
Chessum & Sons* 4,300
W. Johnson & Co., Ltd. 4,257
Turtie & Appleton 4,223
F. & H. F. Higgs 4,200
Battley, Sons & Holness 4,120
G. Smart 4,110
H. E. Neville 4,072
F. Gough & Co. 3,979
W. Dunham 3,854
D. Parkins 3,835
* Too late.

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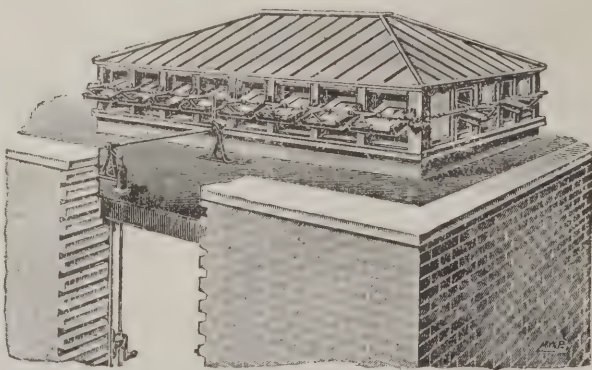
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LYDNEY.—For water works for the Lydney Rural District Council: Contract No. 1 engine-house, &c., No. 2 reservoir, No. 3 mains. Mr. J. Fletcher Trew, C.E., County Chambers, Gloucester:—

	No. 1.	No. 2.	No. 3.	Total.
Wood, Bristol	£263	£2,330	£8,830	£11,423
Griffiths, Stonehouse ..	998	3,005	7,332	11,335
Shardlow, Nottingham ..	771	1,047	7,300	9,118
Byard, Gloucester	680	1,908	6,846	9,434
Reading, Wolverhampton ..	957	2,030	5,031	8,018
Meredith, Gloucester	828	2,400	5,829	9,057
Riley, Cheltenham	841	2,569	5,704	9,114
King, Gloucester	680	1,970	6,093	8,743
Powell, Conwili, Elvert ..	759	2,148	5,306	8,213
Perkins, Bristol	625	1,911	5,090	7,626
Seull, Bristol	600	1,078	5,189	6,867
Hancock, Bristol	—	—	9,500	—
Woodward, Gloucester	—	—	6,800	—
Todhunter, Godalming	—	—	6,588	—

	No. 1.	No. 2.	No. 3.	Total.
Jowett, Brighthouse	—	—	6,348	—
Beaven, Gloucester	—	—	6,084	—
Mason, Cardiff	—	—	5,852	—
Dixon & Fish, pipes, &c., only ..	—	—	3,047	—
Engineer's approximate estimate...	000	1,750	5,470	7,220

		£	s.	d.	£	s.	d.
Sainfoin mixture ..	do.	4	10	0	5	5	0
Straw ..	do.	1	10	0	2	4	0

CURRENT MARKET PRICES.

FORAGE.									
				£	s.	d.	£	s.	d.
Beans	..	..	per qr.	1	16	0	2	0	0
Clover, best	..	..	per load	4	15	0	5	10	0
Hay, best	..	..	do.	5	5	0	5	12	6

OILS AND PAINTS.

Castor Oil, French ..	per cwt.	1	5	1	1	6	0
Colza Oil, English ..	do.	1	7	6	—	—	—
Copperas ..	per ton	2	0	0	—	—	—
Lard Oil ..	per cwt.	2	12	0	2	12	6
Lead, white, ground, carbonate do.	do.	1	4	10	—	—	—
Do. red ..	do	1	0	4	—	—	—
Linseed Oil, barrels ..	do	1	10	3	—	—	—
Petroleum, American ..	per gal.	0	0	6	0	0	—
Do. Russian ..	do.	0	0	5	—	—	—
Pitch ..	per barrel	0	7	0	—	—	—

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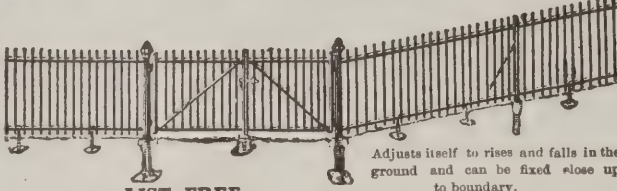
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THE BUILDERS' JOURNAL

ARCHITECTURAL RECORD

JULY 9, 1902.

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An Architectural Causerie.

Liverpool Cathedral. ON p. 329 of this issue will be found the full text of the agreement entered into between the Liverpool Corporation and the Cathedral Committee for the purchase of the selected site, St. James's Mount. There is nothing exceptional in the document except the purchase price—£10,000. When the agreement came before the Liverpool Corporation last week there was considerable discussion on this matter, and the fact that a proposal for an amended valuation was rejected by only three votes on a division in which seventy-five members took part shows that opinion was very evenly divided. The Committee have undoubtedly secured the site very cheaply—their own diocesan surveyor, Mr. Bradbury, valued it at double the amount agreed upon. It will be noticed that the purchase-money is to be paid within six months of the passing of the Bill. It will also be observed that the Committee are to keep the site as open to the public as possible; that they are to take all responsibility as to any rights of light which the cathedral may affect; and that, among other things, their stoneyard or workshop is to be in a position approved by the Corporation, so that lessees of property in St. James's Road shall suffer as little annoyance as possible. Meanwhile Mr. Bodley and Mr. Shaw are busy with the eighty portfolios which have been sent in by architects, among whom are doubtless some who do not practise but "whose tastes have led them to study and design buildings of an ecclesiastical character."

Grindlay's Bank, Westminster. THIS building, known as 54, Parliament Street, is of fire-proof construction throughout, the roof being constructed wholly of iron and concrete and the front portion covered with Westmorland slates. The ground storey is of grey Aberdeen granite, rubbed to a fine face but unpolished; above this the front is carried out in Portland stone and Bazley White's red brick facings. The sub-basement, basement and ground floor are used by Messrs. Grindlay & Co., the upper floors being occupied as offices and caretaker's apartments. The architect is Mr. Alfred Williams, F.R.I.B.A., of 34, Henrietta Street, Covent Garden.

Artistic Copyright. Two busts of the King and Queen were produced by a certain North-London firm, and absolutely exact copies of them were made and sold, without authority, by a gentleman named Mudie. As a consequence, an action was brought against him in the King's Bench Division, and some interesting remarks were made at the hearing on Saturday last. It appears that the busts were not made from personal sittings, but from the study of photographs and pictures, and

and in reply to the defendant, who asserted that the busts were not like the King and Queen, quaintly observed that they might therefore be all the more original. However, the plaintiffs got judgment for an injunction and £50, together with all the defendant's moulds and busts; and thus the case ends; but the essential points relating to "originality" and "artistic merit" are worth noting, because they have a much wider bearing than on these particular busts (of which, by the way, 600,000 were sold during six months).



GRINDLAY'S BANK, WESTMINSTER, S.W. ALFRED WILLIAMS, F.R.I.B.A., ARCHITECT.
DRAWN BY SYDNEY NEWCOMBE.

on this account the defendant claimed that they were not original; in fact, he contended that models of the King and Queen were the property of the nation—nobody could take out a patent for them. A war correspondent, Mr. Ernest Prater, gave evidence that the plaintiffs' busts had artistic merit. The defendant denied that, and asked the witness whether the busts had eyebrows and properly-formed ears. Mr. Justice Walton said the question was one of originality,

A Scotch College of Architecture. AT the annual general meeting of the Edinburgh Architectural Association held last week Mr. Henry F. Kerr, A.R.I.B.A., took as the topic of his presidential address "A College of Architecture and the Technical Arts in Edinburgh." Such a subject necessarily involves architectural education in general, and the president had occasion to refer to the Paris schools and to those in Germany and America,

while, coming to our own country, he spoke of the Architectural Association in London, the technical schools established by various municipal authorities throughout the country (though no special reference was made to Liverpool) and the School of Art at Glasgow: but what provision for the education of architects was to be found in Edinburgh?—"In connection with the Heriot-Watt College some technical classes (excellent so far as they went), drawing and painting under the Board of Manufactures and the Royal Academy, and other isolated and little-known studios where the bud of artistic genius was tempted to bloom." The Edinburgh Architectural Association had started classes for teaching practical work, but workshops were never added, and later the School of Applied Art took the place of the work classes, but still without workshops. Thus, as there is no really practical school in Edinburgh Mr. Kerr suggests that a "central national college of architecture and the technical arts" should be established. Mr. Kerr's proposal is one which deserves support. So far as architecture in particular is

HALL-ITH' WOOD.

RATHER more than two years ago the ancient building known as the Hall-ith'-Wood, near Bolton Lancashire, was made over to the public of that town by Mr. W. H. Lever, of Bolton and Port Sunlight. Since that time the old house has been put in a state of repair, and carefully restored, and will in future be used as a museum. The house stands about a mile and a half north-east of Bolton, on what was formerly a picturesque situation on the top of a steep river cliff. The aspect of the Hall and its surroundings at the beginning of the last century can be gathered from an engraving in Baines's "History of Lancashire" from a painting by William Linton. To-day Bolton has stretched itself out on both sides of the Hall-ith'-Wood, though without as yet having closed it in. But the stranger now seeking the old house finds his way there, or to within a very short distance of it, on an electric tramcar.

The accompanying illustration shows the Hall before the recent restoration was carried

of restoration. "In many cases," says a local newspaper, "where it has been necessary to replace some beam or portion of a beam, or any wooden support, the restorers have used old wood found in the attics of the house, so that while being thoroughly sound and strong, it is in keeping with the original and does not have the jarring effect of new material." The work of restoration has been carried out by Mr. E. A. Ould and Mr. J. Simpson, architects.

The older portion of the Hall-ith'-Wood is a splendid specimen of the black and white half-timber style of building so common in Lancashire during the Elizabethan period. Inside, the house contains some interesting work, notably an old oak staircase in a fine state of preservation, which is accounted for by its having been covered over for years by many layers of paint. These have been carefully removed.

Apart from its architectural merits the house claims attention. After having been successively the residence of the Brownlows, the Norrises, and the Starkies, the Hall was divided into small tenements and let to humble occupants. One



HALL-ITH'-WOOD, NEAR BOLTON, LANC (BEFORE RESTORATION).

concerned, there has already been far too much general teaching about the art of it all, and far too little training given in the practical working of materials and the direct application of constructional principles. This fact is being increasingly appreciated, and visits are now paid by architectural associations to works in progress and to workshops as well as to celebrated old buildings. The archaeological feeling is being killed, or, rather, put secondary to the practically architectural. There are many learned men who can amaze with their discussions on the art of the Greeks, the Romans or some other dead race: and it is their practice to judge all modern work by their old standards: and just so far as the productions of to-day correspond with those of the past, so are they good or bad. This exclusive archaeological feeling is not a thing for architects to affect. They need to know what their predecessors have done, and, more important, exactly how they did it: but their learning must not stop at this: it must come to our own times and apply itself to that evolution in architecture which is the only manner of advance. Such is the task, and we welcome any scheme which seeks to apply itself to it in a definite practical way.

The house consists of three distinct parts, the oldest being the picturesque timber portion on the east side, which probably dates from the end of the fifteenth century. Two separate additions seem to have been made at different times, both in stone. The earliest of these, on the north-west, would appear to have been built about 1591, which is the date over the fireplace in one of the rooms. In the next century a large parlour or drawing-room and a porch were added on the south-west. On a spout-head still preserved on this portion of the house is the date 1648. The illustration, therefore, shows the earliest and latest parts of the building. The gable on the south side, here shown boarded up, has now been opened out, revealing a six-light window. Owing to the window tax imposed in former years, many of the windows were filled up with lath and plaster or boards. These have now all been reopened. The stone finials in the south front have likewise been restored. Only one of these remained, and this has been faithfully copied. The effect of these twelve stone spikes is perhaps rather disturbing than otherwise to the former "repose" of the old house. Wherever it has been found possible old material has been used in the work

of these was the father of Samuel Crompton, the inventor of the spinning mule, who took up his residence here in 1759. Samuel was then six years of age, and continued to live at the Hall-ith'-Wood, after his father's death, till the year 1785. Crompton's invention brought him fame, but not wealth. "The Hall-ith'-Wood," we are told, "was besieged by manufacturers who came to purchase and also to pry into the secret of the wonderful machine. Every trick was resorted to to get admission to the house, and when this failed many climbed up to the windows by the aid of barrows and ladders in order to get a glimpse of the 'wheels'." To Bolton people the house is known as Samuel Crompton's Home, and in the future the Hall-ith'-Wood is to be a kind of shrine to Crompton's honour. The building enjoys what is perhaps a unique distinction, a representation of it occupying the whole of one of the bronze panels on the base of Crompton's statue in Bolton. A plan and sheet of sketches of the Hall-ith'-Wood appear in Mr. Henry Taylor's "Old Halls in Lancashire and Cheshire." We are able to publish the accompanying line sketches by Mr. G. M. Brimelow through the courtesy of the "Bolton Journal and Guardian."



HALL-I'TH'-WOOD, NEAR BOLTON : VIEW FROM THE SOUTH-EAST (AFTER RESTORATION).

ST. BRIDE'S, FLEET STREET.

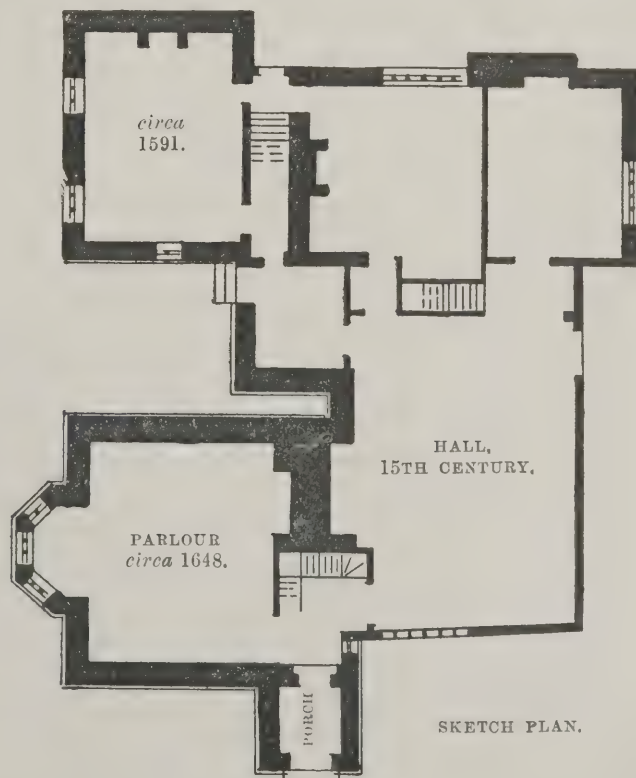
The Rebuilt Steeple.

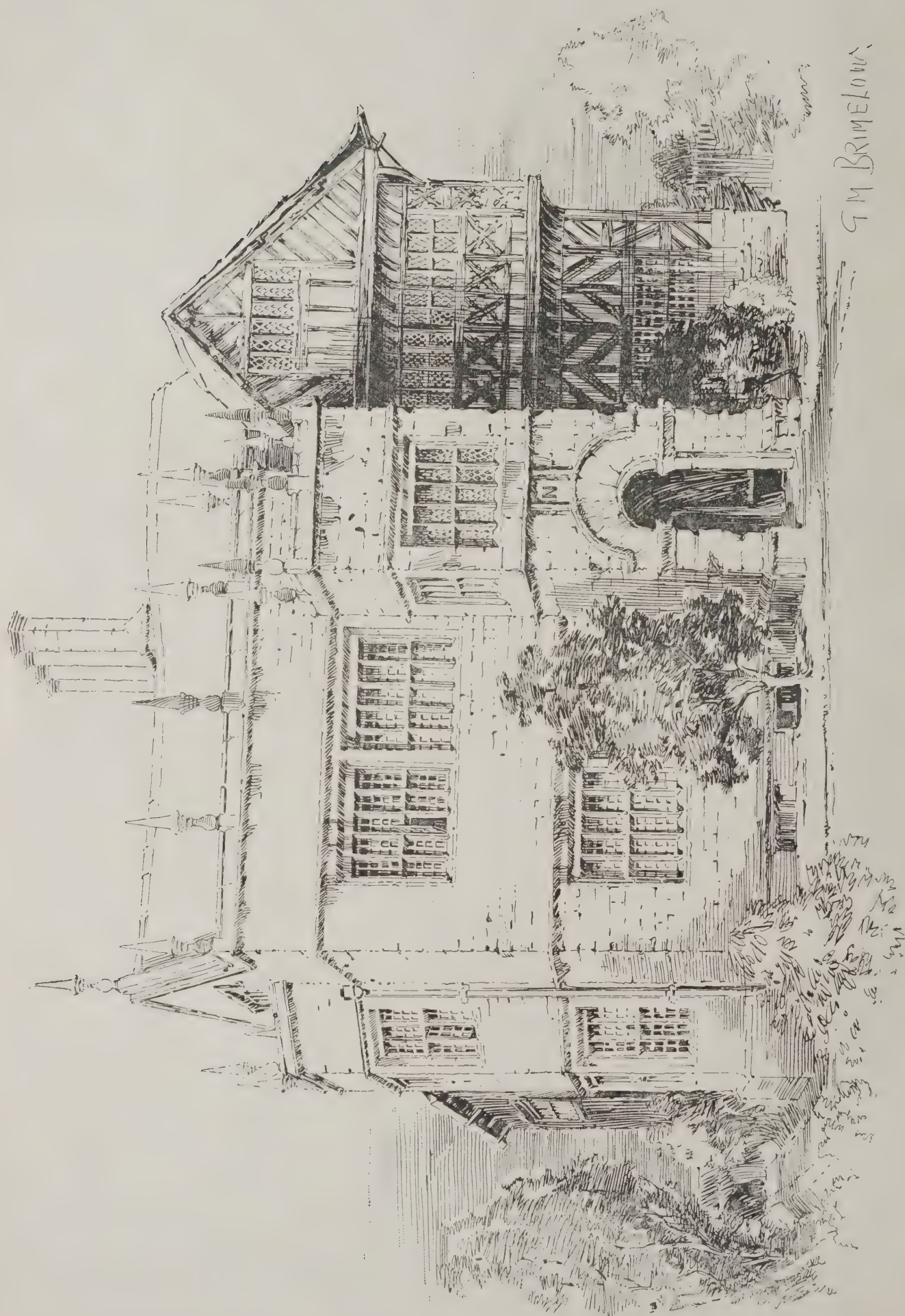
THE work of rebuilding the steeple of St. Bride's Church, Fleet Street, is now so far completed that the gilt ball and vane stand clearly out against the sky, most of the scaffolding having been removed. Fifty-five feet of the steeple needed to be taken down and rebuilt, the same stones being used. Wren followed the plan of clamping together the stones in the steeple with iron bands, and in course of time these iron clamps became corroded and rusted and actually forced apart the stones which they were intended to bind together. In rebuilding the steeple gun-metal clamps have been used instead of iron. It is interesting to notice how the work at St. Bride's has been accomplished. It was commenced by passing 9in. deals through the windows of the tower, and on these a strong stage was constructed with a rail and guards around the sides. The stage was strengthened and supported by struts and stays extending to ledges of the building below. On this stage upright poles were fastened, and a scaffolding built to the apex of the steeple, which is 226ft. high. The workmen then began to take down the stones, not by any rough knocking or pickaxe work, such as house-breakers adopt, but by inserting chisels into the lime. The stones were then lowered by means of a "crab" to the stage below, where they were redressed. They were all numbered and the dimensions taken, so that each could be replaced in its former position. To enable the men to reach the stage some scaffolding was erected beside the tower, additional support being gained by cross-pieces and stays resting on windows and ledges of the tower. At intervals small stages were built in this scaffold with openings to which ladders led, so that a man could ascend to the first stage—a quarter or third of the distance—by one ladder and within the woodwork of the scaffold; and then pausing at the stage would change to the next ladder, which led him another portion of the way upward, and so on up to the landing stage. In this way a man, even if he were not a trained

steeple-jack, could ascend in comparative safety. Ladders amid the scaffolding led up to the summit of the spire. Pulleys and ropes were, of course, also in use.

The present St. Bride's Church was built in 1680, the spire being added twenty-one years afterwards. The total cost was £11,500. Originally the steeple was 234ft. high, but 85ft. had to be taken down in 1764, when the steeple was struck by lightning. On its reconstruction the

height was reduced by 8ft. It is the highest of all Wren's steeples, exceeding that of St. Mary-le-Bow by 4ft. 3in. The tower itself is 120ft., and thence the spire rises in four octagonal storeys, the two lower being Tuscan, the third Ionic and the fourth Composite, the whole culminating in an obelisk and vane. The view of the steeple from Fleet Street being obstructed by houses, advantage was taken of a fire in 1824 to make a space leading up to the church.





HALL'S WOOD, NEAR BOLTON: SOUTH FRONT.

LIVERPOOL CATHEDRAL.

The Agreement for the Site.

THE following is the agreement between the Liverpool Corporation and the Cathedral Committee with reference to the acquisition by the latter of St. James's Mount and Gardens as the site for a cathedral:—

1. The Corporation shall sell and the Cathedral Committee shall purchase for the sum of £1,300 the reversionary interest of the Corporation in the several leases of the piece of land coloured pink, with the six dwelling-houses thereon erected, together with the gardener's cottage, and also the estate and interest of the Corporation in the roadway leading to the back of the said dwelling-houses. (This is known as St. James's Mount.)

2. The Corporation shall be entitled to remove, if they desire to do so, the materials of the said road together with any pipes or sewers which may be in the same.

3. The Corporation shall sell and the Cathedral Committee shall purchase for the sum of £10,000 all the estate and interest of the Corporation in the piece of land known as St. James's Mount Gardens.

4. The purchase of all the said lands and premises and other interests shall be conditional upon the said Bill becoming law during the present or ensuing session of Parliament, and the purchase shall be completed and the purchase moneys paid within six months from the said Bill receiving the Royal Assent, and in default of such completion the Cathedral Committee shall pay interest on the purchase money at the rate of 4 per cent. per annum until completion.

5. During the erection of the cathedral the Cathedral Committee shall interfere as little as possible with the St. James's Mount Gardens, and if practicable allow the public to have the use of so much of the gardens as lies to the south of the shelter now standing thereon, and the Cathedral Committee shall not remove the public conveniences coloured yellow on the said plan without the consent of the Corporation, and shall not interfere with the drains running from such conveniences, and adequate access to such conveniences shall be provided from the gardens by the Cathedral Committee.

6. The Corporation shall maintain any part of the gardens which shall be left by the Cathedral Committee for the use of the public and the conveniences.

7. After the erection of the said cathedral the Cathedral Committee shall allow the public to have the use and enjoyment as public walks and pleasure grounds of so much of the St. James's Mount as shall not be actually occupied by the said cathedral, such use and enjoyment to be upon such conditions as shall be hereafter arranged between the Corporation and the Cathedral Committee, and, notwithstanding anything contained in the said Act, the Cathedral Committee shall not be entitled to stop up and discontinue any of the roads and footpaths on St. James's Mount, except so much of the said roads and footpaths as may be stopped up and discontinued by the erection thereon of the cathedral. In case of any difference arising between the Corporation and the Cathedral Committee as to the conditions upon which St. James's Mount shall be used and enjoyed as public walks and pleasure grounds, such difference shall be referred to a sole arbitrator to be appointed under the provisions of the Arbitration Act, 1889.

8. The Cathedral Committee shall not erect on St. James's Mount without the sanction of the Corporation any dwelling-house or building, other than a cathedral and buildings not being dwellings appertaining thereto.

9. Any stoneyard or workshop or other temporary structure which may be required to be placed on St. James's Mount in connection with the erection of the cathedral shall be placed in a position to be approved by the Corporation or their surveyor for the time being, and as far away as possible from the leasehold property of the Corporation situate in St. James's Road, in order that the lessees of such property may suffer as little annoyance and damage as possible during the erection of the cathedral.

10. Nothing in this agreement shall prejudice

or affect the rights of any of the lessees of the Corporation with regard to any claim which they may have against the Cathedral Committee for damage to their property by abstraction of light or otherwise through the erection of the cathedral, and any claim for compensation for such damage may be made, notwithstanding that the properties of the lessees may not actually be taken by the Cathedral Committee, and in case of difference the amount of such compensation shall be ascertained and determined in the manner provided by the Lands Clauses Consolidation Act, 1845, with reference to the settlement of questions of disputed compensation in respect of lands injuriously affected.

11. In consideration of this agreement being in all respects specifically performed and observed on the part of the Cathedral Committee and of the Committee undertaking to insert in the Liverpool Cathedral Bill, 1902, now being promoted, any clauses which may be necessary to carry out such agreement or any part thereof, the Corporation agree not to petition against the preamble of the said Bill.

The Portfolios and Designs.

June 30th was the last day for the reception of the portfolios of drawings or designs for the cathedral, but on account of the dislocation of railway and postal arrangements consequent on the Coronation holidays the Building Committee extended the time until the next day. Designs have been received from nearly all parts of the Empire, as well as from the United States and some cities of Europe. The architects who may be chosen for the final competition will be paid 300 guineas each whether or not they are successful. The Committee are to meet this week to arrange with their advisers for the examination of the designs sent in. This will occupy some months. The designs are in many instances so full as to occupy quite large packing-cases.

EGYPTIAN EXPLORATION.

Professor Flinders Petrie's Discoveries at Abydos.

THE Egyptian antiquities found by Professor Flinders Petrie at Abydos and by Drs. Grenfell and Hunt in the Fayum (Egypt Exploration Fund), together with some photographs and drawings from the Temple of the Kings (Sety I.—Egyptian Research Account), are on exhibition till July 26th at University College, Gower Street, from 10 to 5. Considering the value of the exhibits, it is to be regretted that no better space could be found for them than the two small rooms in which they are cramped.

The present year's work of the Fund has extended over every historical period of Egypt; but the most important result, scientifically, has been the accurate connection of the prehistoric and historic periods. Thanks to the existence of an early town within what was later enclosed as the temenos of Osiris, we have an unbroken stratified series of deposits ranging over four or five centuries of the earliest kingdom. These deposits of the town dwellers increased about 20 in. during each century; and hence by levelling the position of all the pottery, flints and other objects, their relative age was fixed. They were then compared with the end of the stages of the prehistoric age and on the other hand with the remains from the Royal Tombs. Thus the continuity from the prehistoric to the historic times is now assured. A diagram illustrating this is shown in the second room.

It is now clear that the great settlement at Abydos began with the founding of the kingdom there. The large tombs of the first dynasty found in this town are a striking and important result, and they provide a large variety of stone and pottery, vases and beads.

Of the XIIth dynasty a great deal was excavated which does not appear in the present exhibition, as it has been imperative to leave till next season the actual clearance of the great tombs discovered. The largest tomb in Egypt—twice as long as those in the *Biban el Mokh*—awaits a complete clearance; but two gigantic sarcophagi of granite have already been seen in it. Another such tomb also awaits next season. This part of the work was mainly in the charge of Mr. A. E. Weigall.

Of the VIth, XIth, XIIth, XVIIIth, XIXth

and XXVth dynasties much sculpture has been found in the ruins of the Temple of Osiris, but the lower and earlier stages of this site have not yet been explored. From the XIth dynasty to the XXXth several tombs have been cleared, mainly finding sarcophagi and funeral furniture of the later period.

On behalf of the Græco-Roman Branch, Dr. B. P. Grenfell and Dr. A. S. Hunt continued their excavations in the Fayum, at Selch, Khamsin and Illahun. In March they moved to Hibeh, on the east bank of the Nile, opposite Feshn (about 100 miles south of Cairo), and began excavations there which will be resumed next winter. Their work was mainly devoted to the search for papyri in Ptolemaic cemeteries, and in this they were very successful.

The Egyptian Research Account work was entirely spent on examining the Temple of the Kings, built by Sety I. (XIXth dynasty), the excavations being conducted by Mr. A. St. G. Caulfield, and the copying of the sculptures by Mr. L. Christie. The result has been to place an entirely new meaning on the construction of the Temple, by showing that it was intended as a funerary chapel for the kings of the first dynasty, who were buried in the desert behind it. An enormous tomb, with inscribed passage, of the XIXth dynasty, also awaits clearing behind this temple.

The Temple of Sety I. is celebrated for its fine sculptures, which are carved with detail and elaboration, and though later than the best work and mainly imitative and formal, yet they are well worth study. Mariette published a synopsis of the parallel texts of the seven chapels, but no general publication nor any accurate drawings of the sculptures have ever been issued. The drawings now shown, and others which are published with them in the volume of the Egyptian Research Account just ready, are of subjects selected for their archaeological interest and detail.

Among these drawings is a very bold one of the bust of Osiris with the ram's horn, a form unknown elsewhere. A plan is shown of the temple and temenos as it was probably originally designed before the change of placing the hinder chambers at the side of the temple. The projection of the temenos wall and the suitable access to chambers show this to have been the plan before alteration. A plan is also exhibited of the temple as actually existing, surveyed by Mr. Caulfield, while above the screens are six large photographs of the temple and on the walls other views of the desert, the former being wonderfully clear. In the window is a block of limestone, originally gilt, which was placed as a foundation deposit beneath a pylon rebuilt by Ptolemy Philopator; also pottery and other objects found in the work of the Research Account.

Among the exhibits of the Græco-Roman Branch of the Exploration Fund are three well-preserved portraits on wood of the first to the sixth century A.D.

In the second room are a number of vases and other objects from a large tomb of the middle of the first dynasty, about the reign of Merneit. After the town had accumulated to a depth of 4 ft. or 5 ft. a part just outside the temple gate seems to have been left unoccupied, and about a dozen tombs were cut in the town rubbish and lined with brickwork. Soon after the town spread again over that ground and covered the tombs over, so that they have never been disturbed. It seems likely that there was an inner chamber of wood of about half the size of the whole tomb; and this would serve to support the roofing of poles and brushwood.

Among other exhibits in this second room are a seated figure of Ranuser (headless), messenger of the prince's table, in black granite; an unusual stele inscribed on all four sides and top; foundation deposits of Tahutmes III. from the Osiris temple; two blocks of Merenra, the oldest sculptures of the temple yet found (the sandstone head, high up, is probably of the XXVth dynasty, from the Osiris temple, and shows a fine naturalistic style of purely Egyptian work); a piece of a column of Antef V., one of several such, which show that he largely rebuilt the Osiris temple; pieces of several other statues, and numerous small ornaments and other objects.

The exhibits are highly interesting to all students of art and architecture.

THE HELLENIC SOCIETY.

Mr. Evans's Latest Discoveries in Crete.

THE annual meeting of the Society for the Promotion of Hellenic Studies was held last week in the rooms of the Society of Antiquaries, Burlington House, Sir Richard Jebb, M.P., in the chair. The report of the Council was read by Mr. H. B. Walters, the acting hon. secretary. It stated that the Council had again made a grant, this time of £100, to the Cretan Exploration Fund. By the aid of this fund Mr. Evans last year carried further his remarkable excavations on the site of Knossos, while Mr. Hogarth made some interesting discoveries at Kato Zakro. The response to the appeal issued by the managers of this fund last autumn was, unfortunately, so inadequate that it was found necessary to confine its operations during the present season to the work at Knossos upon which Mr. Evans had again been successfully engaged, though it was doubtful whether the funds now available would suffice for the completion of the excavations. Meanwhile another very promising Mycenaean site at Palaikastro, near Sitia, in Eastern Crete, which Mr. Hogarth had hoped to excavate under the auspices of the Cretan Exploration Fund, had been undertaken by the British School at Athens. A British school had now been established at Rome on much the same lines as the school at Athens. Satisfactory progress had been made with the facsimile of the Codex Venetus of Aristophanes, which was announced in last year's report. The facsimile itself was practically complete. Another special publication, which was announced last year, that of the report on the very important excavations undertaken by the British School at Athens on the site of Phylakopi, in the island of Melos, had also made good progress. Forty-nine new members had been elected during the year, while thirty-seven had been lost by death or resignation. The present total of subscribing members was 759 and of honorary members twenty-five, the names of Professors Federico Halbherr and Adolph Wilhelm having been added to the roll of honorary members.

After the report had been adopted Mr. Arthur Evans gave a short account of his excavations in Crete. There were, he said, four distinct lines of walls of the Palace of Minos, made necessary, it might be, by successive inundations. He described the various chambers and frescoes and the complicated system of underground communication. A considerable number of very interesting frescoes—of the same school as those of Melos and Phylakopi—were also discovered. Many bits of naturalistic foliage and lilies were found, and *dissecta membra* of sculptures of last year's discovery were successfully pieced together. Specimens of marvellous beauty came to light of early Minoan pottery—seal impressions of a primitive style, some with cryptographic inscriptions; clay tablets with the linear script, developed from a pictorial prototype and not derived from the earlier types hitherto known. The economic history of these ancient days was to some extent disclosed by a series of accounts. The excavations allowed an approximate reconstruction of a Minoan street, some of the houses being, as we should say, of a surprisingly modern character and displaying a highly-advanced civic development. The height of the houses enabled one to realise the description of the island as "hundred-citied Crete," and pointed to a congested population. The statuary was remarkable; bronze wire was used for hair. In the eastern part of the palace was found a shrine of the later Mycenaean age of Gnosso whereon were two stucco horns with sockets between them for a handle and near them cylindrical terra-cotta images. One of the most interesting discoveries was a wall design of elaborate mazes illustrative of the ancient traditions. His thanks were due to Mr. Mackenzie and Mr. Fyfe in the labours of reconstructing the remains of this ancient site and civilisation. Unfortunately funds were greatly needed.

Mr. Carr Bosanquet, director of the British School at Athens, described briefly the work of the school on the east of the island, and the result pointed to Palaikastro as the chief of this part of the island.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE ANNUAL EXCURSION.

THE annual excursion of the Edinburgh Architectural Association was held on Friday and Saturday last.

On Friday evening the party left for Carlisle, which was inspected on the following day. The town hall is an ancient structure, partially rebuilt in 1717, possessing nothing in its architecture that merits notice. At the back, however, stands a very interesting building called Redness Hall. This contains on the two upper floors eight apartments, which are occupied respectively by the guilds—consisting of incorporated companies of merchants, butchers, tailors, smiths, tanners, weavers, skippers and shoemakers. In front of the town hall stands the Market Cross, erected in 1682, consisting of a column, with plain shaft and pedestal, rising from the centre of a flight of six circular steps.

Carlisle Castle.

Carlisle Castle stands on the most northern, the highest and strongest portion of the site which was included in the walls of the city of Carlisle. The headland consists of a mass of red sandstone and rises 50ft. or 60ft. above the River Eden. The east, north and west slopes are very steep, but to the south the ground falls gradually towards the city. The plan inside the castle walls is nearly a right-angled triangle. The area is less than three acres. A portion of the wall connecting

the castle with the city on the west side still remains, and is apparently of Norman origin, but has some buttresses which are apparently Edwardian. Upon this wall, south of the moat and 30yds. north of the city boundary, is King Richard III.'s or the Tile Tower, 26ft. wide by 20ft. deep, of no internal projection. The south wall is by far the most original. The grey stones in it correspond well in size and shape with those used in the Roman wall and with Roman buildings, and have evidently been taken from some Roman works. The tooling is here weathered away, but on the outside, protected by the grass, can be found many instances of "diamond broaching." The main entrance to the castle is in the middle of the south front, about 40yds. west of the keep. The drawbridge over the moat was removed in the last century and replaced by a stone bridge which crosses the ditch and leads up to the gatehouse called William de Trely's Tower. The castle consists of two wards, outer and inner, divided by a cross wall or curtain, and in the outer ward would doubtless be found the mound of command and execution. The buildings within the outer ward have been described as "modern, of various degrees of ugliness, and painfully substantial; some are detached and harmless, others are built into the curtain so as to conceal and more or less injure it." Within the inner ward a remarkable succession of buildings have been erected—first, the Norman keep; opposite, an Edwardian palace, connecting the two, a lofty barrack built in the time of Queen Elizabeth. The barrack was pulled down in 1812 and the palace destroyed between 1824 and 1835. The



CORRIDOR AND OLD STAIRCASE, HALL-1TH'-WOOD, NEAR BOLTON.

keep is rectangular, 66ft. by 61ft., and at present only 68ft. high. A very extensive and interesting view can be had from the roof. The keep, though much disfigured to make it carry artillery and much obscured by its conversion into prisons, &c., is for the most part original, and, if cleared, as it should be, would form a tolerably perfect specimen of a Norman keep with a full share of mural chambers and appendages.

Carlisle Cathedral.

Carlisle Cathedral now consists of a fragmentary nave and aisles, with bays only remaining, an aisleless transept with a chapel on the east side of the southern limit, a choir with aisles and processional path and a central tower.

It was originally a Norman minster of moderate size, and was one of the instances of divided possession, *i.e.*, two churches in one building: the nave belonged to the parish of St. Mary's, the chancel was the church of the Austin Canons. This interesting example of a double church was destroyed in 1871, when the present parish church was erected on a site near the east end of the cathedral. The cathedral was originally an establishment of Austin Black Canons, and is said to have been commenced in 1092, completed in 1101, converted into a cathedral 1133, choir taken down and enlarged 1245-55, burnt 1293, rebuilt 1352-62, stained glass inserted in east window 1382-94. The transept was partially burnt in 1392, upper part of tower built 1401, stalls erected 1401, legendary paintings added 1484; the monastery suppressed 1536, nave and chapter-house destroyed 1646, ancient ceiling and bishop's throne destroyed 1764, restored 1853-56. A subject of interest are the sculptured capitals of the choir pillars, which, beginning with the second from the east end on the south side, form an unrivalled series of the occupations of the seasons.

Naworth Castle.

After inspecting these buildings the party left for Naworth Castle. The earliest information we have about it is the licence to "crenellate" granted in 1335 by Edward III. to Ranulph de Dacre. Probably before this date there was a small fortified tower, called a Pele Tower; and on making a careful examination of the Carlisle, or old tower, at Naworth it appears that the lower part of it and of the southern curtain wall formed a pele tower from which the castle grew. The tower is almost identical in size with the Strickland Tower at "Rose Castle," the lower portion of which was erected by Bishop Halton in 1292. The Dacre Tower consists on the ground floor of the vault, a staircase in the thickness of the wall giving access to the chamber on the first floor. The vaulting seems a later addition, as it is of better construction than the wall from which it springs, and the doorways on the floor above were constructed for a floor at a lower level. Probably Ranulph de Dacre found this tower incomplete or in ruins, and he completed it, and battlemented it and the walls of the Bailey. The next evidence we have about the castle is written in the heraldic devices of the great builder of the family, Thomas, Lord Dacre. Apparently in his time the castle had fallen into bad repair. He repaired the existing buildings and added to them. He rebuilt the upper part of the Dacre Tower, and entirely rebuilt Lord William Howard's Tower. This tower was evidently an afterthought, and has been constructed at a more recent period than the external walls of the quadrangle, which at this part form a very acute angle. The tower consists of only the upper storeys, which rise above the walls of the main building and are carried upon a deeply-ribbed series of arches, spanning the angles between the walls of quadrangle, a most daring and ingenious piece of construction. Lord Thomas also built the Hall, which occupies the northern side (substantially the one so well known to Naworth visitors), the gatehouse and other offices. The shell of the gatehouse now only remains, and all traces of the drawbridge, chains, portcullis, &c., have been obliterated. To Lord William Howard we must attribute the domestic character the castle bears. He rebuilt the upper portion of the tower which bears his name, constructed the gallery along the eastern face of the castle, and decorated and beautified the whole structure. The household books show that if the first Dacre built a fortress, the first Howard made it into a complete house of the Jacobean character and probably commenced



STAIRCASE, HALL-I' TH'-WOOD, NEAR BOLTON.

his repairs and additions in 1602. We learn that the first Earl of Carlisle "repaired the castle and made it fit for the reception of a family," and died in 1684. The third Earl probably did more in that way, and put a music gallery and screen in the Hall. The disastrous fire of 1844 necessitated a remodelling, which was carried out by M. Galoin. The exterior happily preserves its ancient face much as left by Lord William.

Lanercost Priory.

The excursion concluded with a visit to Lanercost Priory, a House of Austin Canons partially rebuilt in the thirteenth century; visited by Edward I., in 1280; injured by Scots in 1296; again visited by Edward I. in 1306, who spent his last winter here; pillaged by Robert Bruce in 1311; visited with great destruction by King David in 1346; dissolved in 1536, and its possession granted to Sir Thomas Dacre; part of the conventual buildings converted into a dwelling-house by Sir Thomas and his son Sir Christopher (now called the Dacre Tower and Dacre Hall); the church neglected and north aisle used for worship. About 1740 the nave was roofed and used as at present for worship; about 1872 the plaster was removed from the interior, the nave ceiled with oak, and oak stalls and pews inserted. Outside the Priory on the green is the basement of a cross erected in 1214—the shaft is now inside and is inscribed with the names of the Pope and sovereigns of Germany, France, England and Scotland then reigning.

THE NEW APE-HOUSE AT THE ZOO.

THE new building devoted to the anthropoid apes in the Zoological Gardens is now open to the public. Including the terrace in front, it forms approximately a square, the sides of which are about 85ft. In one respect the house is an experiment and, it must be admitted, a somewhat costly one, the contract price falling very little short of £7,000. Its main feature is the entire separation by means of a glass screen of the part appropriated to the visitors from that in which the animals are confined. This is quite an innovation in this country, though it has lately been adopted in several ape-houses built in Holland and Germany. Immediately within the screen run the warming-pipes of the hot-water apparatus, with several updraughts by which cool fresh air from the outside can be admitted. There are four large cages, each forming a cube, of which the sides are 16ft. The material is white enamelled brick, with granolithic floors, filled in with cement, so that the whole can be easily and thoroughly cleansed. The partitions between the cages are furnished with sliding doors. The house is lighted from above and from the back. The apartments under the house devoted to the animals are large and airy. Some will be occupied as day-rooms by the keeper, others as stores, and one as a hospital in which sick apes may be kept in small cages, subject to dry or moist heat, as may be thought desirable.

ARTS AND CRAFTS.

Exhibition of L.C.C. Students' Work.

AN exhibition of work done by students at the London County Council Central School of Arts and Crafts was held last week at 316, Regent Street, W. This school was opened about six years ago with the special object of encouraging the industrial application of decorative design, and the majority of those who attend it are actually engaged in the various crafts taught, the teaching being intended to supplement apprenticeship, so that students who, owing to the sub-division of processes of production, are kept to one branch of work learn other branches which otherwise they would not.

There are only a few architectural drawings; but these are of very fair merit. Mr. V. Hooper shows a design for a roadside country-house (which, by the way, is particularly reminiscent in parts of Mr. Halsey Ricardo, the instructor). Mr. S. B. Caulfield exhibits a design for a clergy-house and settlement, and also one for a town church; the former is certainly the better of the two, but there are interesting features in the latter—such, for example, as a large lightly-indicated cross on the end window with a heart on the crossing of the arms. Mr. Charles J. Bathurst also shows a design for a country-house.

The modelling work exhibited is particularly good, which is doubtless due in great measure to the teaching of Mr. Roscoe Mullins. There are several designs for a Bunyan monument for the Baptist Church House, a building for the new Holborn-Strand thoroughfare designed by Mr. Arthur Keen and illustrated in our issue for October 23rd last. The accepted design, by Mr. R. Garbe, is certainly very imposing—a clean piece of work fitting its niche well. Mr. Garbe also exhibits some panels for the Baptist Church House and a well-modelled composition of "Echo and Narcissus." Several very noticeable clay studies from the life are exhibited by women students, while among other exhibits are some spandrels in white plaster, a modelled cap for a column by Mr. G. A. Barnes, a carved corbel by Mr. J. Menheer, and some bell-push designs by Mr. D. Burns Brown. Mr. S. B. Caulfield shows a lead garden vase, the relief decoration on which is, however, not sufficiently bold. It is well to note in this connection that special classes are held in stone-working and lead work for architects, so that students may acquire the very necessary practical knowledge in these branches of building.

The stained-glass work exhibited is of very fair merit, a central place being given to a duplicate by Mr. C. Presswell of Bellini's Virgin and Child in the Church of the Frari at Venice.

In the ordinary practice of stained-glass work one man does cartoons, another traces them on the glass, a third leads the pieces together. In the stained-glass class of the school, students are encouraged to learn the whole of their craft. If a student wishes to paint on glass, he is here taught to cut the glass for painting on and to lead it up when it is painted; he thus learns how cutting and leading influence the design and painting of a window (as they do most vitally). The students are also taught, side by side with their craft practice, the elements of design, and are encouraged to make patterns for "quarries" and for diapers and accessories of dress and ornament in figure-subject windows. Those who show special aptitude are encouraged to practice original composition, using the life class of the school for studies, the model being posed specially for them.

Other exhibits include Holy Grail compositions (on the familiar lines) by students of the life class, repoussé work (a copper dish by Mr. E. Jones deserving special mention), wallpaper designs, metal work, bookbinding, woodcarving, lithography, woodcuts in colour, chasing and similar work, a very fine hanging designed by Mr. Cecil Miller for Warner & Sons, some inlaid work and several specimens of embroidery; among the last of which we notice a table centre having a pattern of oak trees with hogs below them, the former having leaves about 2ft. long and acorns like small tubs.

New Patents.

These patents are open to opposition until August 11th.

1901.—Refuse-Destructors.—11,540. J. FORSTER, Cowley Hill, St. Helens, and A. J. LIVERSEDGE, 7, Arundel Street, Strand, London, W.C. The charging openings are preferably in the crowns of the furnaces, or in the side or end walls near the top, and the refuse is discharged from the carts on to a platform which can be tilted.

Cement and Lime Kilns.—13,154. W. L. H. ROBERTS, Holbrough Court, Rochester. This invention relates to a combination of most of the advantages in other kilns: a further object being to cheapen the construction of the hood and to enable repairs to be more quickly effected. The cooling chamber is of the same diameter as the calcining chamber at the top, but increases considerably at the bottom: there is thus a very large cooling area as compared with the calcining chamber. The lower part of the cooling chamber is like an inverted cone and has three or four drawing-eyes. There is no tendency of the clinker to stick and air is admitted freely. The hood has a metal skeleton covered with expanded metal, plastered.

Varnish.—14,456. W. L. SHOOTER, The Lindens, Railway Street, Hornsea, Hull. A suitable quantity of shellac is placed in the desired quantity of water and heated to boiling point. Borax or boric acid and liquid ammonia are then added. By this means the shellac is perfectly dissolved in the water: hitherto a spirit solvent has needed to be used, increasing the cost. The following proportions produce good results:—Shellac, 2lbs.; borax, 6ozs.; liquid ammonia, 4ozs.; water, 1 gal.

Locks.—15,142. A. PETERSEN, 48, Gothersgade, Copenhagen. The lock is opened by the simple insertion of the key. The latter is cut with a special rack that operates a wheel.

1902.—Trusses.—6,336. M. DUMAS, 6, Rue Watteau, Brussels. The trellis-work of the truss is composed of flat metal bars or bands turned over the main bars at the top and bottom, the whole being embedded in concrete.

The following specifications were published on Thursday last, and are open to opposition until August 18th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1901.—4,970. MICHELL, non-conducting blocks and slabs. 12,208. DONLE, closet-flushing apparatus. 12,713. WEHNER, regulator valves for flushing closets, urinals, &c. 12,852. CROTOGINO, ladders for use in attending to machinery. 13,028. GUNYON (*Sesino & Zamboni*), apparatus for automatically opening and closing doors, gates, &c. 13,226. BOUSFIELD (*Mingazzi*), scaffolding. 13,245. LENT & WHITEHEAD, wood tenoning machines. 13,413. KILBY, kiln for burning cement, lime, &c. 13,948. RODNEY & PARKES, locks. 14,096. EVANS, dry pipe-valves. 14,925. HOLT, grindstone rest. 14,964. KATZENBERGER, JOHNSON & SURKEY, locks. 15,098. BROOK, device for use in connection with street gulleys. 16,623. STRINGER, safety appliance for lifts. 22,575. SEEBOLD & MARTIN, apparatus for covering surfaces with paint.

1902.—2,580. MOYLE & WARNER, tile floors. 2,657. STOMBERT & ROTH, stop valve for taps on water pipes. 3,493. JURSCHINA, artificial stone. 3,976. DEMPSEY, loading and unloading apparatus especially applicable for laying concrete or granitoid in streets. 5,267. RUSSELL, weather-casing brick for walls. 6,312. WALCHNER, windows. 6,871. JAEGER, concrete and ironwork arches. 8,097. TOTH, door locks. 8,563. TANSLEY, earthenware pipes with internal jointing device. 8,598. HAINSWORTH, safety-suspending apparatus for skips, &c. 8,672. MICHEL, removable enamelled tile coverings for walls, &c. 9,475. HESELSCHWERDT, automatically flushing water-closets. 9,821. HOW & KING, casement stays or fastenings. 10,319. BEAUREGARD & GOODING, door checks and springs.

A Yacht Club House Competition.—Over 40 sets of designs were submitted in the recent competition held by the Norfolk and Suffolk Yacht Club for designs for a new club house at Lowestoft. The prize of £50 has been awarded to Messrs. G. J. & F. W. Skipper, architects of Norwich.

L.C.C. ARCHITECT'S DEPARTMENT.

Mr. Woodward's Criticism.

MR. WILLIAM WOODWARD, A.R.I.B.A., takes advantage of the recent fire in Queen Victoria Street to criticise the London County Council and its fire-protection requirements. He says:—

London is governed by several Acts of Parliament, but the two which most concern the building public are the London Building Act of 1894 and the Factory and Workshop Act of 1901, the latter having been prominently brought before the public in connection with the lamentable fire in Queen Victoria Street. Under the latter Act the London County Council furnishes a schedule of its requirements to facilitate escape in case of fire, and from my personal experience, in several cases, I assert that whilst the officials are as earnest and as courteous as could be desired, they are quite inexperienced as practical men, with the necessary result that a series of official fads are promulgated which, whilst not securing the object all have in view, entail upon building owners unnecessary cost and delay, secure a mutilation of their premises which most seriously interferes with their profitable occupation, and materially reduce their letting value.

Absurd requirements are made as to special bolts and fastenings to doors, which involve a dissertation at Spring Gardens to understand, and which would prove in practice the sure means of prevention of escape in case of panic from fire. Ridiculous provisions as to stairs; insistence upon so-called fire-resisting corridors which, whilst interfering seriously with the ground floors of premises, would most surely result in jamming the inmates up when converging upon those corridors for escape; and many other vexatious notions are enforced which have found their origin in "Criticism from a bureaucratically narrow standpoint."

The London Building Act of 1894 was hurried through in such a manner that the meaning of many of its provisions is the constant source of doubt amongst lawyers, architects, district surveyors and the London County Council officials. That being so, it is obvious that the administration of that Act should be in the hands of well-experienced practical men, as far as possible removed from bureaucratic notions and from an abnormal love of red tape; but, judging from my own experience, based upon constant mixing with practical building matters during the last thirty-five years, I assert that the architect's department of the London County Council is administered by courteous well-meaning officials possessed of very limited experience in actual building operations. The want of real practical knowledge has resulted in requirements which would be amusing if they were not so costly as regards money and time to architects and clients and unnecessary loss to ratepayers. And what does this mean to the public and to the London County Council itself? It means utter contempt for the London County Council by experienced practical architects, and a desire on their part to do all they possibly can to avoid going to Spring Gardens at all. It means that they advise their clients to sacrifice all they possibly can to render unnecessary any application whatever to the London County Council. When an architect submits, on behalf of a client, drawings for some constructional work (I am not now alluding to the Factory Act) the duty cast upon the architect's department is to see that all legal requirements are complied with, but not to employ at the expense of the ratepayers a staff of assistants to make minute calculations of the strength of steelwork, &c., when that has already been done by better qualified men at the expense of the client, who would be responsible for the making good of future defects should they arise. It is quite obvious that if the London County Council proceeds upon the lines now adopted, it will become the bureau for the supply of architectural designs to the public, free of direct charge, and ensure forms of construction and strength of materials which will certainly last till the crack of doom.

Commercial Conditions in South Africa from the British trader's point of view are to be reported on by the special correspondent now dispatched by "Commercial Intelligence."

Views & Reviews.

A Guide to Edinburgh.

This new edition is in the same form as the numerous other illustrated guide-books published by Messrs. Ward, Lock & Co., being of a handy size and stoutly bound between cloth boards. It contains more than 200 pages, and when it is mentioned that in addition there are fifty illustrations, four section maps, a map of the district, and plans of the Castle, St. Giles's Cathedral, &c., it will be seen that the book is wonderfully cheap at a shilling. The particulars of the numerous buildings in and around Edinburgh are clearly set forth and full, so that the architect or student visiting the city is not left wondering when such or such a building was erected, who was its designer or by whom it was altered. There is no necessity for us to go

the designer, by one who has also studied the theories of art, does not fall into the usual error of laying too great stress on particular sides of the subject, and insisting on hard and fast rules. The designer works by his eye, feeling his way through the design, and the logical processes by which he proceeds are not easily apparent, even to himself. Now Mr. Crane has set himself to explain some of the principles and methods of these logical processes of thought, striving by this means to educate the eye and brain to be sensitive to appreciate with minuteness the qualities which have made the finest works of art what they are, so as to be of similar service when it is required to do constructive work itself.

Mr. Crane does not attempt to relegate the principles in design he propounds to any natural physical laws, though he is suggestive in this direction, in pointing analogy with natural objects and their structure. Incidentally the

to life and habit, was really more analogous to the development of mechanical science in our own day, where each new machine is allied to its predecessors, though it supplants them. The one law being adaptability, the one aim to apply means to ends, and more and more perfectly, inessentials and superfluities are shed, and invention triumphs. It is, too, a collective advance, since each engineer, each inventor, builds upon the experience of both his fore-runners and his fellow-workers, and everything is brought to an immediately practical test. We are not yet in the same healthy condition as regards art, and art can never be on the same plane as science, though art may learn much from science, chiefly perhaps in the direction of the inventive adaptation of analogous principles. But in art the question is complicated by human feeling and association, and her strongest appeal is to these and by these, and as yet we do not seem to have any terms or



CROMPTON'S ROOM, HALL-I'TH'-WOOD, NEAR BOLTON. DRAWN BY G. M. BRIMELOW.

into the book in any detail, more especially as it is a new edition, but we can certainly recommend it as a remarkably cheap and useful production.

¹ "A New Pictorial and Descriptive Guide to Edinburgh." London: Ward, Lock & Co., Ltd. Price 1s.

Line and Form.

A second edition of Mr. Walter Crane's "Line and Form" has just been published by Messrs. George Bell & Sons, uniform with "The Bases of Design," reviewed in these columns on p. 267 of our issue for June 11th. The size of this edition is crown 8vo, the first being medium 8vo. This smaller size has not in any way detracted from the illustrations, and is, if anything, an improvement in handiness. The book is an excellent companion volume to "The Bases of Design." The subject of design is a most difficult one to treat practically, but this book, being written from the point of view of

book gives many hints on the practice of designing, such as the way to test the repeats in a wallpaper. Graphic artists are usually inclined to insist too much upon beauty being a quality apart from utility or fitness, and this leads them to ignore construction. Mr. Walter Crane does not, however, fall into this error, but insists upon design springing from construction and fitting its functions. The "evolution" of design is not forgotten by Mr. Crane, though his whole book in a way is built on a true evolutionary theory, but the word is usually used of design in the sense of its historical sequence, and not as it should be, of the fitting of conditions, i.e., its functional or organic expression, combined with sequential development. In regard to this matter the following passage by Mr. Crane is worth repeating: "The movement of art in the Middle Ages, exhibiting as it does a gradual growth and a constant vitality, always accompanying and adapting itself to structural changes,

equivalents precise enough to describe, or analysis fine enough to discover them."

"Line and Form," by Walter Crane. Second Edition. Price 6s. nett. London: George Bell & Sons, 4, York Street, Covent Garden, W.C.

Addition to the National Gallery.—An altar-piece by Lorenzo Monaco, representing the Coronation of the Virgin, in its original frame, formerly in a church at Certaldo, in Tuscany, has been added to the National Gallery in Trafalgar Square. The picture is supposed by Messrs. Crowe & Cavalcaselle to have formed part of a larger altar-piece of which the two wings are in the National Gallery, catalogued as of the school of Taddio Gaddi. But besides that the picture is apparently complete in itself, the different scale of the figures in the two wings referred to shows that they could not have belonged to it. It is hung in Room III.

BUILDING NOTES AND MEMORANDA.—V.

By T. E. COLEMAN, F.S.I.

(Continued from p. 313, No. 386.)

THE ordinary average prices for the principal items of building materials are given in the following list:—

Bricks.

Average prime-cost or trade price at London railway depôt, river wharf or merchant's yard; exclusive of cartage or delivery.

	Per 1,000.
<i>Ordinary bricks.</i>	
Common stocks - - - -	31
Peterborough or Fletton, machine-made - - - -	28
Blue Staffordshire (best) - - - -	88
Ditto ditto (ordinary) - - - -	78
Stourbridge firebricks - - - -	86
<i>Facing bricks.</i>	
Picked stocks - - - -	40
Bright facing stocks - - - -	52
Best white facings - - - -	62
Ditto red facings - - - -	64
Ditto Fareham red - - - -	72
Ditto blue Staffordshire - - - -	95
Ditto ditto bull-nose - - - -	100
Best red or white cutters and rubbers - - - -	125

Per 1,000.

Glazed bricks.

	1st quality.	2nd quality.
Salt-glazed stretchers - - - -	220	180
Ditto headers - - - -	210	170
Ditto double stretchers - - - -	270	230
Ditto ditto headers - - - -	250	210
Ditto bull-nose or quoins - - - -	260	220
White-glazed stretchers - - - -	260	220
Ditto headers - - - -	240	200
Ditto double stretchers - - - -	370	330
Ditto ditto headers - - - -	310	270
Ditto bull-nose or quoins - - - -	340	300

Note.—For approximate cost of coloured glazed bricks of ordinary tints add 25 per cent. to the prices of white-glazed bricks; for brilliant reds or other superior colours add 50 per cent.; and for stock ornamental patterns, on white or coloured ground, add 100 per cent.

Cements, Lime, Sand, &c.

Average prime-cost or trade price at London railway depôt, river wharf or merchant's yard; exclusive of cartage or delivery.

	Per ton.
<i>Cements.</i>	
Portland cement - - - -	32
Roman ditto - - - -	29
Medina ditto - - - -	30

Limes, &c.

	Per yd. or hundred.
Chalk lime (lump) - - - -	9 0
Grey stone lime (lump) - - - -	9 6
Ditto (ground) - - - -	10 6

	Per ton.
Blue lias lime (lump) - - - -	22
Ditto (ground) - - - -	24
Newcastle fireclay (ground) - - - -	23
Stourbridge ditto - - - -	27

Plasters, &c.

	Per ton.
Parian cement - - - -	65
Keene's ditto - - - -	65
Plaster-of-Paris (coarse) - - - -	40
Ditto (fine) - - - -	60

	Per cwt.
Whiting, washed (lump) - - - -	1 6
Hair (bullock's) - - - -	12 0

Sand, &c.

	Per yd. cube.
Clean sharp pit sand - - - -	4 6
Thames sand - - - -	4 9
Clean pit gravel - - - -	3 9
Thames gravel or ballast - - - -	4 0
Well-burnt clay ballast - - - -	3 3

Laths.

	Per bundle of 500ft. run.
Laths, fir, single - - - -	1 6
Ditto lath and half - - - -	2 2
Ditto double - - - -	2 9

Slates.

Average prime-cost or trade price at London railway depôt or merchant's wharf; exclusive of cartage or delivery.

	Per 1,000 of 1,200.
	Duchess (24in. by 12in.) Countess (20in. by 10in.) Ladies (16in. by 8in.)
Blue Bangor (best) - - - -	17 12 7
Ditto (seconds) - - - -	15 11 6
Blue Portmadoc (best) - - - -	16 11 6
Ditto (seconds) - - - -	14 10 5
Green Westmorland (best) - - - -	20 15 8
Ditto (seconds) - - - -	18 14 7

	Per ton.
Green Westmorland, mixed sizes for slating in diminishing courses (best) - - - -	6
Ditto ditto (seconds) - - - -	4

Tiles.

	Per 1,000.
Plain red roofing tiles - - - -	41
Best dark red Broseley tiles - - - -	50
	Per dozen.
Plain ridge tiles (18in. long) - - - -	4 0
Rolled ditto (ditto) - - - -	6 6
Hip and valley tiles - - - -	3 9

Stone in Block.

Quarry-dressed in random sizes. Average size of blocks, 20ft. cube.

	Per ft. cube.
	Price on rail at quarry. s. d. Price at London depôt. s. d.
<i>Limestones.</i>	
Ancaster - - - -	1 4 1 11
Bath - - - -	1 2 1 8
Beer - - - -	1 0 1 7
Caen - - - -	0 10 1 7
Chilmark - - - -	1 3 1 8
Hopton Wood - - - -	1 10 2 5
Ketton - - - -	2 0 2 6
Portland, best selected - - - -	1 8 2 2
Ditto second quality - - - -	1 7 2 1
<i>Sandstones.</i>	
Corsehill (red) - - - -	1 2 2 6
Craigleith - - - -	3 0 4 6
Darley Dale - - - -	1 6 2 3
Mansfield (red) - - - -	1 5 2 4
Ditto (white) - - - -	1 5 2 4
Yorkshire (Bramley Fall) - - - -	1 7 2 7
Ditto (Robin Hood) - - - -	1 8 2 8
Ditto (Scotgate Ash) - - - -	1 10 2 10
<i>Granites.</i>	
Aberdeen - - - -	5 0
Cornish - - - -	4 0
Devon - - - -	4 0
Guernsey - - - -	3 9
<i>Marbles.</i>	
Black - - - -	from 15 0
Dove - - - -	18 0
Rouge-royal - - - -	20 0
Sicilian - - - -	10 6
Spanish - - - -	13 0
Statuary (Italian) - - - -	40 0

Timber.

Average prime-cost or trade price at London docks or timber-merchant's yard; exclusive of cartage or delivery.

	Per Petersburg standard.
<i>Red or yellow deals.</i>	
Best Russian or Swedish brands 1sts - - - -	22
Ditto ditto 2nds - - - -	18
Ditto ditto 3rds - - - -	14
Ordinary Swedish brands 1sts and 2nds - - - -	16
Ditto ditto 3rds - - - -	12
<i>White deals.</i>	
Petersburg, 1sts - - - -	14
Ditto 2nds - - - -	12
<i>Other soft woods.</i>	
American yellow pine, 1sts - - - -	26
Ditto ditto 2nds - - - -	18
Ditto ditto 3rds - - - -	14
Pitch-pine - - - -	17

	Per load (50ft. cube).
<i>Timber in log.</i>	
Dantzic or Riga (best middling) - - - -	5
Ditto (seconds) - - - -	4
Pitch-pine - - - -	5

	Per load (50 ft. cube).
American yellow-pine - - - -	5
Ditto ash - - - -	6
Ditto birch - - - -	6
Ditto oak - - - -	7
Teak - - - -	17
Dantzic or Memel oak - - - -	6
Greenheart - - - -	8

	Per ft. cube.
<i>Timber in plank.</i>	
Kauri pine (in plank) - - - -	4 0
Wainscot oak (in log) - - - -	5 0

	Per ft. super. (lin. thick).
	s. d.
Mahogany, Cuba - - - -	0 8
Ditto Honduras - - - -	0 10
Oak wainscot - - - -	0 8
Walnut, American - - - -	0 10
Cedar, Cuba - - - -	0 4
Satin-wood - - - -	1 6

	Per square.
<i>Prepared floor-boards.</i>	
lin. white deal battens, wrot., edges shot - - - -	12
lin. ditto wrought, grooved and tongued - - - -	13
1½in. ditto ditto ditto - - - -	15
lin. yellow deal battens, wrot., edges shot - - - -	15
lin. ditto wrought, grooved and tongued - - - -	16
1½in. ditto ditto ditto - - - -	19

Iron and Steel.

Average prime-cost or trade price at London railway depôt, river wharf, or merchant's yard; exclusive of cartage or delivery.

	Per ton.
<i>Wrought-iron bar or plate.</i>	
Round, square, or flat "common" bar - - - -	8
Ditto Staffordshire "crown" bar - - - -	9
Ditto ditto "marked" bar - - - -	11
Ditto "Best Yorkshire" bar (Farnley or Lowmoor brands) - - - -	20
"Common" girder plate - - - -	8
Staffordshire "crown" plate - - - -	9
Ditto best boiler plate - - - -	11
"Best Yorkshire" boiler plate - - - -	25
	Per ton.
<i>Sheet-iron.</i>	
Flat, 16 to 20 gauge - - - -	10 13
Ditto, 21 to 24 gauge - - - -	11 14
Corrugated, 16 to 20 gauge - - - -	12
Ditto, 21 to 24 gauge - - - -	13
Hoop-iron - - - -	9 15

	Per ton.
<i>Mild steel, bar or plate.</i>	
Round, square or flat bar - - - -	9
Ordinary bridge or ship plate - - - -	8
" boiler plate - - - -	9

	Wrought iron.	Steel.
<i>Joists, girders, &c.</i>		
Belgian rolled joists, ordinary sections - - - -	5 6	6
English ditto ditto - - - -	6 7	7
Ditto angles, tees, channels - - - -	7 8	8
Ditto compound joists or girders - - - -	9 10	10
Ditto flitch plates - - - -	8 9	9
Ditto stanchions - - - -	9 10	10

	Per ton.
<i>Cast iron.</i>	
Sash weights - - - -	5 0
Socket pipes, 3in. to 6in. diam. - - - -	6 0
Ditto 7in. to 12in. diam. - - - -	5 15
Ditto 13in. to 24in. diam. - - - -	5 10
Columns or stanchions, ordinary patterns - - - -	8 0

Note.—For pipes coated with Angus Smith's composition add 5s. per ton extra. For pipes having turned and bored joints add 5s. per ton extra.

Lead.

Average prime-cost or trade price at London depôt or merchant's yard; exclusive of cartage or delivery.

	Per ton.
Pig lead, common - - - -	12
Milled sheet lead - - - -	13
Pipes, ordinary - - - -	14
Ditto, soil - - - -	16

Zinc.

	Per ton.
Spelter - - - -	18
English sheet - - - -	23
Vielle Montagne - - - -	25

Copper.

	Per ton.
English cake or ingot - - -	57
Sheet copper - - - - -	69
Bar or rod - - - - -	69

Paints, &c.

Pure white lead, ground in oil - -	21
Red lead (dry) - - - - -	20
Putty - - - - -	8

Per tun.

Raw linseed oil - - - - -	30
Boiled ditto - - - - -	32
Sperm oil - - - - -	50
Whale oil - - - - -	25

Per gallon.

Turpentine - - - - -	3 2
Copal varnish - - - - -	16 0
Oak varnish - - - - -	10 0
Paper varnish - - - - -	12 0
Black japan varnish - - - - -	15 0
French polish - - - - -	10 0
Knotting (patent) - - - - -	9 6
Stains for wood - - - - -	8 6

(To be continued.)

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Associateship, Surveyors' Institution.

BURY.—G. F. B. writes: "Which of the following books will be most useful to me while preparing for the Associateship Examination of the Surveyors' Institution? *Quantities*: Dobson & Tarn's 'Student's Practical Guide to Measuring and Valuing'; Bartholomew's 'Specifications'; Nesbit's 'Mensuration'; Leaning's 'Quantity Surveying'; Laxton's 'Builder's Price-Book,' *Mensuration*: Todhunter's 'Mensuration for Beginners'; Moore's 'Elementary Treatise on Mensuration' and 'Mensuration'—Weale's Series. All these books are mentioned in the syllabus of the Institution."

We advise Dobson & Tarn's book on Measuring, Leaning's "Building Specifications" and "Specification No. 5," Nesbit's "Mensuration," Leaning's "Quantity Surveying," and Laxton's Price-Book.

Protecting Panelling against Damp.

CROYDON.—PANEL writes: "Which is the best way to prevent dampness affecting whitewood panelling fixed to 3in. rough backings inside rooms with 1½in. brick external walls? The panels average 18in. wide and are 3ft. 9in. high."

Coat the wall behind the panelling with a mixture of pitch and tar applied hot. Cement rendering would also be an efficient protection from damp.

Qualifications for a Sanitary Inspector.

LONDON, W.—C. T. B. writes: "What are the necessary qualifications for a sanitary inspector?"

The duties of inspectors of nuisances imposed by the Public Health Act, 1875, are defined by the order of the Local Government Board, March, 1891. An examination is held by the Sanitary Institute, which grants certificates of competency to act as Sanitary Inspectors, and these certificates are usually required of candidates by local boards and corporations. A syllabus of the subjects of the examination can be obtained from the secretary of the Institute, Mr. E. White Wallis, at the Parkes Museum, Margaret Street, W., price 6d.

Articles.

SUNDERLAND.—T. K. writes: "I have been four years with an architect as pupil. No written agreement was made when I began, and although I asked for indentures several times,

they were never given to me. I paid no premium. Quite recently I was offered a post as junior assistant, which I accepted. Does the want of articles make any difference to my position?"

Articles are not necessary, though useful, and are not required of candidates for the R.I.B.A. examinations. We do not think your chances of obtaining engagements is affected by not having been articulated; testimonials from previous employers are the best, and are usually required.

A Sketching Tour in the North of France.

LONDON, S.W.—FRANCE writes: "I intend going on a fortnight's sketching tour in the north of France. What district or towns would you suggest I should visit which would be of most use in preparing for the final examination of the R.I.B.A.?"

See the article on "Towns of Northern France" in our issue for August 22nd, 1900.

Intersection of Solids.

DERBY.—PROBATIONER writes: "In the testimonies of studies for the R.I.B.A. intermediate examination two sheets are required showing the 'intersection of solids.' What is meant by this?"

The words "intersection of solids" we should have thought would have been fairly explicit themselves. What is required is that the student shall know how to draw by the laws of geometry the angles at which one solid will intersect another, and to give a perspective representation. The methods of doing this are given in J. F. Heather's "Practical Plane Geometry" and "Descriptive Geometry," and E. A. Davidson's "Elements of Practical Perspective."

Law Cases.

An Architect's Claim for Wages.—At Lancaster County Court recently William S. Varley, formerly a Blackburn architect, sued Albert Gorton, architect, Morecambe, for £24 14s. wages in lieu of notice and holidays, and commissions on quantities connected with the contract for the Baptist Chapel at Morecambe. On May 3rd he received a letter from defendant remarking that he was sorry he had had to part with him. Plaintiff alleged he never received any notice, and claimed a week's wages. He also claimed for a fortnight's holiday in addition, as he had done work for Mr. Gorton when business was pressing, which prevented him taking his holidays. Judge Coventry said there was no custom involving payment for holidays not received, and a verdict was given for defendant.

Brick Manufacturers Heavily Fined.—At the Birmingham Stipendiary's Court last week Messrs. S. Barnett & Sons, Ltd., brick manufacturers, Dudley Port, were summoned for employing five young persons after the specified hours of work on May 16th. Mr. J. E. Ashworth, factory inspector, stated that in consequence of information which reached him he went to the defendants' brickworks shortly before seven o'clock at night, and found the five boys, the eldest of whom was only sixteen, at work, although their employment should have ceased at six o'clock. At the same time he found five women at work, and altogether he could have taken over fifty summonses out against the firm. The stipendiary (Mr. Neville) said he must make owners of works realise that the Factory Act could not be deliberately slighted. A fine of 40s. and costs was imposed in each case; total, £12 15s. 6d.

National Gallery Stands.—In the House of Commons last week Mr. Trevelyan asked the First Commissioner of Works whether it was his intention to demolish at once the whole of the wooden structures adjoining the National Gallery; and, if so, whether he would secure the expeditious execution of the work by employing a larger number of workmen than at present engaged. Mr. Akers-Douglas answered the first part of the question in the affirmative, and added that the contractors had been instructed to use all possible despatch in the removal of these structures.

Engineering Notes.

The Ormskirk Scarlet Fever Hospital, Aughton, has been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent Manchester stoves with ornamental tiled sides and descending smoke flues.

The E.L.B. System in France.—Whilst the English company was busily engaged with Coronation requirements on this side of the water, the French company was attending to the equipment of several of the visitors to our Naval Review, as, for instance, the French cruiser "Montcalm" and Baron Rothschild's yacht. The French company is now busily occupied with preparations for the Government and municipal celebrations of July 14th, having only recently completed the arrangements of the great fête at Neuilly. The London Stock Exchange and Westminster Hall have been decorated on the E.L.B. system.

Electricity in Carnarvonshire.—An important movement, having for its object the supplying of electricity for lighting and traction purposes throughout Carnarvonshire, has just been set on foot by Sir William Preece, K.C.B., and Mr. Charles H. Rees, of Carnarvon. In the course of an address at the Cymrodorion section of the National Eisteddfod, held at Carnarvon in 1894, on the industrial resources of Wales, Sir William Preece referred to the unusual facilities afforded by the district for an electric installation on a large scale. Since then various schemes have been propounded, but it is only now that anything like a workable scheme has been presented. It is proposed not only to introduce electric light into the populous centres of the county, but to construct electric trams-lines and to seek the co-operation of quarry owners with the view to the substitution of electricity for steam as motive power. The movement has already met with considerable support.

Tramway Extensions in Lancashire.—The Liverpool Corporation, whose lines before terminated at Old Swan, have lately extended them to the city boundary at Knotty Ash, where they join the Prescott Light Railway Company's lines, which are of the same gauge and practically the same electric construction. At Prescott the lines of the New St. Helens and District Tramways Company start and run through Prescott, Rainhill and Eccleston to St. Helens. At the latter town will commence the tramways of the South Lancashire Electric Traction and Power Company, whose scheme comprises a route of over seventy-eight miles, with a single tract length of 105½ miles. The lines will connect St. Helens, Manchester, Bolton, Warrington, Leigh, Atherton, Hindley, Haydock, Tyldesley, Westhoughton, Walkden, Swinton, Worsley, Lowton, Earlestown, Newton-in-Makersfield and other places. Twenty miles of these latter lines are well advanced, and are expected to be completed in a few weeks.

The May-Oatway System of Fire Alarms has been installed at Poplar Workhouse. The protection of the building, which is of great extent, is entrusted to 276 automatic detectors, their conductors being led through seventy-five wall boxes. Any of these detectors or boxes may be operated by hand, or they will be brought into action at the earliest period in the life of a fire by the rise of temperature which is quickly generated. From the point of detection the alarm is automatically transmitted to the sleeping quarters of twenty-five officers situated in various parts of the building at Poplar in such a manner that, though they are notified of a fire, the inmates would not know that there was one in progress, and there would consequently be no panic. The trials which have been made at the workhouse clearly demonstrated this feature of the alarm, the bells being sounded in 25sec., 45sec., 32secs., and 1min. 15sec. respectively, and that under the most unfavourable circumstances, all the windows and doors being left open, while under ordinary conditions they would probably all be closed, at night-time at any rate.

A Pamphlet giving full particulars of our Three Schemes of Insurance will be sent post free on application to the Manager, BUILDERS' JOURNAL, Effingham House, Arundel Street Strand, W.C.

Keystones.

The New Church of St. George, Darwen, is being erected.

A Memorial of Rossini, the composer, has just been erected in the Temple of Santa Croce, Florence, where his remains have lain since 1887.

Rhodes's Mausoleum.—A model of the imposing mausoleum to be erected over the remains of the late Mr. Cecil Rhodes has been erected temporarily on the Chelsea Embankment.

Sir William Emerson, in reply to the congratulations of the architects of the Three Towns Branch of the Devon and Exeter Architectural Society upon his recently receiving the honour of knighthood, has written to Mr. B. Priestley Shires, A.R.I.B.A., hon. secretary and treasurer of the branch, expressing his very heartiest thanks for their message.

University College Hospital, London.—The Hospital Committee have appointed Mr. George Hornblower, F.R.I.B.A., of No. 2, Devonshire Terrace, Portland Place, W., architect to the hospital in succession to the late Mr. Henry D. Shepard, who received the appointment upon the resignation of the late Sir A. W. Blomfield, A.R.A.

The Council of the Society of Arts have awarded the Society's silver medal for the following papers read before the Society during the session 1901-2:—J. Gordon Parker, "Leather for Bookbinding"; Herbert Stone, "The Identification of Wood, its Application to Scientific and Commercial Purposes"; J. Clifton Robinson, "Electric Traction"; Edward T. Scammell, "The Timber Resources of the Australian Commonwealth"; Halsey Ricardo, "The Architect's Use of Enamelled Tiles."

Devon and Exeter Architectural Society.—The "Proceedings" for 1901-2 give summaries of the lectures on "The Development of the Dwelling-House," by Mr. C. J. Tait, A.R.I.B.A.; "Bacteria in relation to Sanitation," by Mr. Ransom Pickard, M.S., F.R.C.S.; "Building By-Laws," by Mr. Arthur S. Parker, A.R.I.B.A.; and "Garden Design," by Mr. F. M. Meyer. The booklet is very neatly produced. Mr. J. M. Pinn, of Exeter, is now the president of the Society; the membership numbers eighty-four.

Sir Caspar Purdon Clarke, C.I.E., F.S.A., who has just received a knighthood, is the art director of the Victoria and Albert Museum. Mr. Clarke is, perhaps, our leading authority on Persian and Indian art and architecture, and on mediæval craftsmanship, especially in England. He is a Fellow of the Institute of British Architects, and first joined the South Kensington staff as keeper of the Indian Museum, the whole arrangement of which, as well as the selection of a great part of its treasures, having been due to his efforts.

A.A. New Premises Fund.—The following are additional donations to the Architectural Association New Premises Fund:—

	£	s.	d.
Lord Ashcombe	-	-	20 0 0
A. F. Faulkner	-	-	5 5 0
A. C. Galbraith	-	-	5 5 0
W. G. B. Lewis	-	-	5 0 0
J. H. Tyars	-	-	2 2 0
W. E. Couch	-	-	1 1 0
H. Black	-	-	1 1 0
	£39	14	0
Donations previously announced	4,278	12	6
Total	£4,318	6	6

A Prize for Spanish Archaeology.—The Board of Education learn, through the Foreign Office, that, in accordance with the terms of the legacy bequeathed to the city of Barcelona by Señor Don Francisco Martorell y Peña, a prize of 20,000 pesetas will be offered for the best original work on Spanish archaeology. The essays may be written in Latin, Spanish, Catalan, French, Italian or Portuguese, and must reach the municipal offices at Barcelona not later than noon on October 23rd, 1906. It is suggested that British competitors should send in their works through the British Consulate in that town. A copy of the regulations under which this competition will be held may be seen at the Board of Education Library, St. Stephen's House, Cannon Row, London, S.W.

A New Vicarage at Sutton St. Nicholas, Lancashire, is being erected at a cost of £2,000.

A New Church at Leigh, to be dedicated to St. Thomas and to cost about £12,000, is being erected.

A Pulpit of Caen stone and Devonshire marble in Gothic style, has been placed in the parish church of Walton-on-Thames.

A South Devon Monastery.—The Trappist monks, who have settled near Kingsbridge, South Devon, have decided to spend the sum of £30,000 in the erection of a monastery.

The East Ham Passmore Edwards Hospital in Shrewsbury Road has been opened. It has cost about £5,000. Mr. Sylvanus Trevel, F.R.I.B.A., of Palace Chambers, Westminster, and of Truro, who had designed the Public Library, was the architect.

Wrexham Church Restoration.—The committee in charge of the reparation of Wrexham parish church recommend, in addition to the work already undertaken at a cost of £7,767, further works estimated to cost £950, including the erection of a carved oak west door in memory of the late Duke of Westminster.

School Struck by Lightning.—During a severe thunderstorm at Lutterworth the girls' elementary school was struck by lightning. No one was upon the premises at the time. The lightning struck the base of the chimney, cut it down the middle, travelled down the flue into the iron stove, which it lifted 1ft. out of its place, and scattered the day scholars' books and slates in all directions.

Newgate Prison has been granted a little longer span of existence owing to the fact that the temporary cells, which are in course of erection in connection with the Sessions House, are not completed. The cells, which will cost when finished about £5,000, are not likely to be in readiness for two months. The Government will not take possession, therefore, until about September next, as the temporary cells must be fit for occupation before the task of demolishing the prison-fortress can be commenced.

Building Rules for Schools.—In the House of Commons last week Sir F. Powell asked the Vice-President of the Council what building rules were now in force in the case of elementary schools, as the seventh section of the Code (1901) had been omitted from the new Code; and what the Government intended to adopt as regarded building rules for such schools in future years. Sir J. Gorst in reply said that the existing building rules contained in the seventh section of the Code of 1901 would remain in force till superseded by new ones. New rules would be issued shortly.

A New Board School at Liverpool has been erected in Birchfield Road, Edge Lane. The school has accommodation for 550 infants and 1,140 mixed scholars. The school is arranged on the classroom system, with a large central hall for drill purposes and for marshalling the scholars. Provision has been made for science, cookery and laundry instruction, in addition to the ordinary elementary subjects. A large swimming bath and gymnasium have also been provided. The school is specially heated and ventilated on the "plenum" system. The total cost, including site, is about £35,000. The architects were Messrs. Willink & Thicknesse, and the contractor was Mr. William Hall, of Christian Street, Liverpool.

The Somerset Archaeological Society recently visited the ancient Roman city of Caerwent. The Rev. W. Downing gave a description of Caerwent church, which is in course of restoration, drawing attention to the fact that the chancel is of the same length as the nave, the arches of which are of horse-shoe pattern, while the north porch originally possessed a choir gallery similar to that of Weston-in-Gardano, in the neighbourhood. The pulpit, of Jacobean design, bears the arms of Lord Tredegar and a representation of Llandaff Cathedral. After luncheon the party was escorted by Mr. A. E. Hudd over the excavations which have been carried out under the auspices of the Exploration Fund, and shown the massive city walls and the remains of the north gate; also a fine tessellated pavement, in which were busts of the seasons and figures of animals and cupids. The museum was also visited, and the fine collection of coins and relics examined.

The Queen Victoria Memorial Fund now amounts to £206,700.

The New Patents Bill was read a second time in the House of Commons on Friday last.

A New Parochial Hall at Halifax is being erected in connection with the church of St. Michael and All Angels' Church, Southowram, Halifax. The new building will accommodate about 200 people, and will cost about £800.

Black Marble.—Immense deposits of marble have been found in Arizona of a quality finer than the best Indian. They include a large ledge of the most valuable black marble. An English syndicate is reported to have secured control.

The Surveyors' Institution held a conversazione at the National History Museum, South Kensington, last week, when the president and Mrs. Vernon received several hundred guests, including the president of the Royal Institute of British Architects.

Cardiff Architect's Failure.—A meeting of the creditors of Mr. D. C. Salmond, architect and surveyor, of Cardiff, was held at the Official Receiver's offices last week. Gross liabilities, £1,119; deficiency, £1,014; failure attributed to "want of business."

Birkbeck Building Society.—The fifty-first annual report presented to the annual meeting of this Society held on Thursday last at Southampton Buildings, Chancery Lane, W.C., records a satisfactory year's work. After writing off all realised losses there is a clear surplus profit of £20,353.

"The House of the Seven Gables": A Problem for Architectural Students.—As already announced, we offer a volume of THE ARCHITECTURAL REVIEW for the most successful plan, with elevations or perspective, of the "House of the Seven Gables," to be sent in not later than July 21st. Full particulars are given on p. 290 of our issue for June 25th.

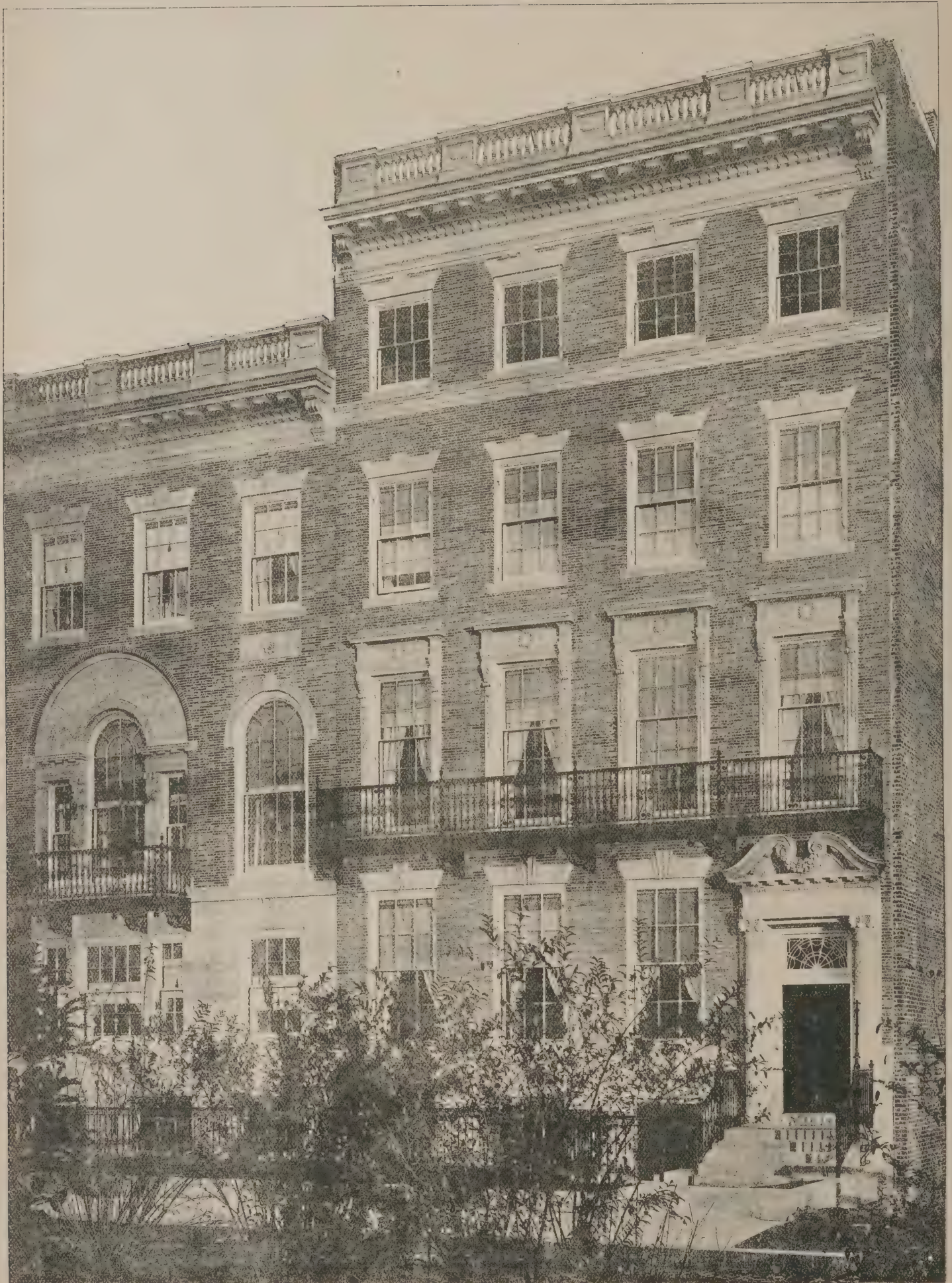
The Opening of the Louisiana Purchase Exposition, of which some particulars were given in our issue for June 25th, has been postponed for a year, so that it will now not take place till May, 1904. There are several reasons for this, the chief one being that, since its inception, the scope of the Exposition has been enlarged. Extra care is to be given to the finish of the buildings and to the laying-out of the grounds. Up to last month the money available for the Exposition amounted to more than £4,000,000.

Restoration of York Castle.—It is proposed, to restore the ancient keep in York Castle known as Clifford's Tower. Negotiations have been pending for some months between the Yorkshire County Committee and the Home Office, with the result that the Government have made a grant of £3,500 towards the object. It is intended to make an almost immediate commencement with the work of restoration, which will consist of underpinning the tower and restoring the leaning sides to the equilibrium.

Another South African War Memorial.—The general committee of the Wykehamist South African War Memorial having adopted the recommendation of the executive committee that the memorial should take the form of a new entrance gate into the school grounds, in place of the one now existing by the racquet-court, met recently to consider plans and designs for the gate submitted by various architects. It was resolved that, subject to the approval of the governing body, Mr. Frank L. Pearson, F.R.I.B.A., should be instructed to carry out the memorial.

Hadleigh Schools, Suffolk, of which we gave an illustration in our plates last week, were designed for the Very Rev. R. Milburn Blakiston and the Managers by Mr. A. H. Ryan-Tenison, A.R.I.B.A., and a glance at the plan will show that the front when completed is to have an extension to the left of the left-hand room similar to the girls' school, thus making the infants' schoolroom a central feature, the bell-cote being upon the roof of it. The work is in red-brick rough-casted and Cooper & Co.'s red tiling. The half-timbering is executed in old fifteenth-century oak. Ventilation and heating, &c., are all carefully considered. The perspective is by Mr. Sydney Castle, of Louvaine Road, New Wandsworth, and the builders were Messrs. Downer & Stephenson, of Hadleigh.

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"INK-PHOTO." R. J. EVERETT & SONS, 55 LUDGATE HILL, E.C.

HOUSE, 24 FENWAY, BOSTON, MASS.
PEABODY & STEARNS, ARCHITECTS.



"INK-PHOTO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

ASSEMBLY ROOMS AND SHOPS, VICTORIA SQUARE, HULL.
JOSEPH H. HURST, City Architect.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, July 9th, 1902.



HOUSE AND GARDENS • CRIPLAND COURT • LINDFIELD • SU



SEX ° THE RESIDENCE OF MRS HOWARTH °

ADDITIONS TO HOUSE P. MORLEY HORDER
GARDENS THOS. H. MAWSON °

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Bricks and Mortar.

APHORISM FOR THE WEEK.
The Greeks excelled not less in the choice of the sites of their edifices than in the architecture of the buildings themselves.—QUATREMERE DE QUINCY.

Our Plates. THE Corporation of Hull propose to open out part of the centre of the city and form a large open area to be known as Victoria Square. From this square all the electric tram routes radiate. The scheme necessitates the taking down of a number of shops and other buildings belonging to the Corporation. Upon the site of these buildings it is proposed to erect thirty-one shops and an assembly hall, at an estimated cost of £82,000. The elevation which we illustrate is intended to face the new square.—The additions to Crippland Court, which have been made according to the designs of Mr. P. Morley Horder, consist chiefly of the gable to the right-hand in the illustration, the verandah, and the conservatory to the left: while the garden has been laid out according to the designs of Mr. Thomas Mawson. The new gable is carried out in brickwork, rough-cast, with a tiled roof.

The British Fire Prevention Committee. THE arrangements of the Committee for July include a test with materials by the British Uraltite Company to-day. Further tests will be of the Pearson Automatic Fire Alarm System, and glazing by the Union Plate Glass Company. The issue of publications during July will comprise Publication No. 71, dealing with a floor constructed of jarrah timber, and Publication No. 72, dealing with a roof test with ordinary slate-roofing and a roof covered with vulcanite. In respect to the recent formation of the new industrial section Alderman Sir W. P. Treloar, J.P., has accepted the first vice-chairmanship.

A Bazaar Scheme. THE Imperial Coronation Bazaar will be held to-morrow and the two following days, Friday and Saturday, in the Royal Botanical Gardens, Regent's Park, N.W., in aid of the Hospital for Sick Children, Great Ormond Street, W.C. A series of white Venetian masts has been erected along the whole length of the broad walk, and fixed to them at either side and at a height of 25ft. is a lean-to awning under which the stalls are erected: there is thus a green path in front of the stalls, whilst the uncovered broad walk avoids the excessive closeness of a marquee. The stalls are built up of square green latticework covered with creepers. A court with a handstand forms the centre of the bazaar; it has on one side the American Court and on the other the Court of the Five Arches; while the end of the vista is closed by the chief glass-house in the gardens. At the main entrance are Queen Alexandra's reception-room and the royal pavilion, both very tastefully erected and given by Messrs. Waring, Ltd. Mr. F. W. Speaight has designed the scheme for the bazaar, and Messrs. W. Whiteley, Ltd., have carried it out, the whole having been done in three days and five nights. We are rather surprised that, in connection with a scheme patronised in such high quarters, statements should be made that the amount of wreathing used would extend to four times the length of Canterbury Cathedral; that the area of the bazaar buildings is nearly three times that of St. Peter's, Rome; that the canvas used would cover the area of St. Paul's Cathedral eleven and a half times, and the lathing, if placed on end, reach a height thirty-seven times that of the Cathedral. Such statements are puerile as well as useless.

Conway Castle. AT a meeting of the Conway Town Council last week a letter was read from the secretary of the Society for the Protection of Ancient Buildings respectfully asking the Council to reconsider a scheme which they were reported to have decided upon for the restoration of the Queen's Tower at Conway Castle. Alderman Hughes stated that the report referred to was inaccurate, and that

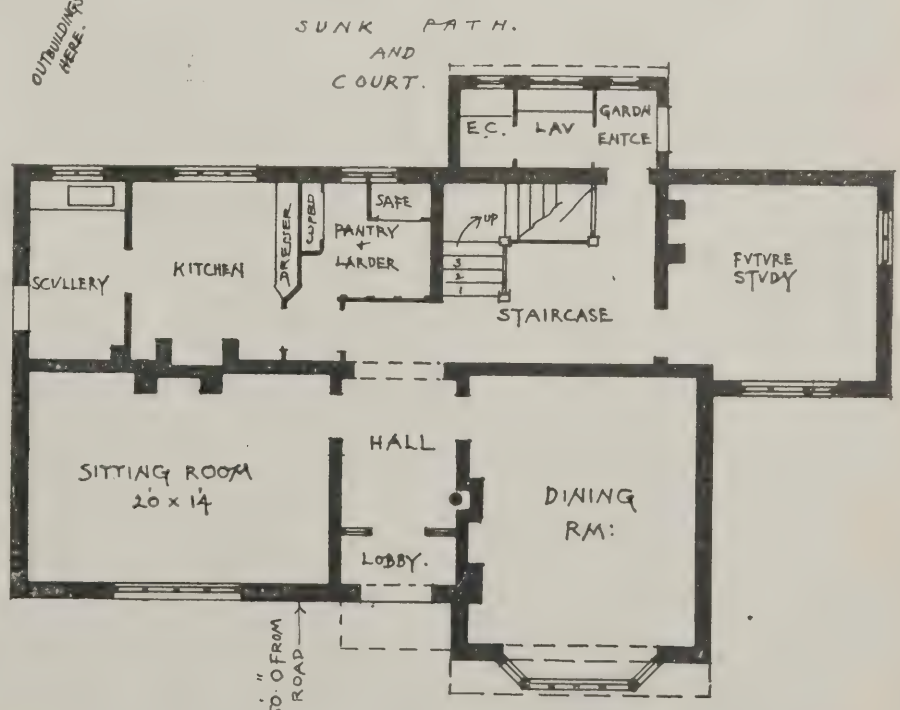


HOUSE NEAR SEVENOAKS, HARRY SIRR, ARCHITECT.

the fact that Mr. Clarence Whaite and Mr. Harold Hughes, two high authorities on art and architectural history, had been consulted in the matter was a sufficient guarantee for the spirit in which the Council approached the question. It was decided to inform the Society that their fears in the matter were groundless.

House near Sevenoaks. THIS house by Mr. Harry Sirr was planned to meet the views of a bachelor with three or four pupils. Local bricks of good red colour were used for the facing* of the ground storey; the upper storey was finished in rough-cast. The tiles for the roof came from the ancient kiln in the vicinity of Battle Abbey. Good bedroom accommodation was provided on the chamber floor, and commodious and lofty servants' apartments in the roof. The bathroom &c., were placed over the lavatory projection, and a good light to the staircase was obtained by a large window in the main outside wall with a gable over it.

A Canadian War Memorial Competition. It is proposed to erect a monument in Montreal in honour of the Canadian soldiers who fought in South Africa and to commemorate Lord Strathcona's patriotic act in equipping a regiment of mounted troops. The committee invite designs for the monument. These must reach Mr. Davidson, hon. secretary, London and Lancashire Chambers, Montreal, by November 1st. The designs must be identified by a motto only and be accompanied by a sealed envelope enclosing the name and address, with the motto only on the outside. An expert will be appointed to aid the committee in their selection. The cost of erection, exclusive of foundations up to the ground level, must be within the money at the disposal of the committee—namely, from £5,000 to £6,000. Competitors may forward a model instead of or in addition to drawings, but in case a model is not sent the drawings must include a perspective view, clearly showing the design in every respect. Two prizes of £50 and £25 are offered.



GROUND PLAN.

MANCHESTER ROYAL INFIRMARY REBUILDING.

PLANS for the rebuilding of the Manchester Infirmary have been prepared by Messrs. J. W. Simpson, F.R.I.B.A., and C. J. Milner, A.R.I.B.A., of Gray's Inn, London. They are on the pavilion principle and contain 452 beds. Provision has been made also for an out-patients' department, five operating theatres, clinical and bacteriological laboratories, and for an accident department. The materials for the exterior are red bricks and stone facings with green-slatted roofs. The estimated cost is £200,000. This sum includes the expense of providing temporary accommodation during the process of reconstruction, but is exclusive of the cost of

pression of confinement which a windowless apartment is apt to convey. The lighting of these wards will, of course, be unexceptionable from a medical point of view. Indeed, the New Victoria Infirmary at Belfast is planned for solely top-lighted wards. The lessening of the heights has materially helped the architects in considering the question of adjoining buildings overlooking the site.

The operating theatres are, however, now increased to five in number, one being placed in connection with each group of wards, with its proper annexes for anæsthetics, &c. A clinical laboratory with X-ray and photographic rooms has been added to the accommodation; also two rooms for bacteriological research. The lecture theatre has been increased in size, and now

A NEW PRESBYTERIAN CHURCH AT FROGNAL.

A NEW Presbyterian Church at Frognal is being erected at the corner of Finchley Road and Frognal Lane. The contractors are Messrs. Dove Brothers, of Islington, and the architects Messrs. Pite & Balfour. The church is to seat 750 persons, and the style is decorated Gothic. It is estimated that the whole building will cost about £19,000.

A.A. SCHOOL OF DESIGN.

A SELECTION of the work done during the session at the Architectural Association School of Design is now on exhibition at 56, Great Marlborough Street, W., from 9.30 a.m. till 7 p.m., Saturdays 1 p.m.; the exhibition remains open till July 19th. None of the designs are of any special merit, though one or two are worthy of mention. In the elementary class the four subjects set were—a sundial, a mortuary chapel, a glazed screen across a hall, and a carriage gateway in stone. In the advanced class the subjects were—a timber footbridge across a stream (26ft. span), a country house, a Sunday school for 250 scholars, and a chancel screen. Most of the designs for the footbridge are too fanciful and elaborate: that by Mr. H. Rogers Houchin is a straightforward piece of work, and Mr. Ernest G. Theakston's is praiseworthy for a similar reason—in each the woodwork is squarely treated. Among the designs for a country house one finds many reminiscences of well-known architects, as well as some strange devices of the students—such, for instance as a "boudoir" about 5ft. square. The design by Mr. T. S. Gregson is deserving of mention, though the arrangement of the porch with its door and seat suggests many catastrophes to the visitor. The drawings themselves are, on the whole, very good.

COMPETITION REFORM SOCIETY.

A GENERAL MEETING of the Competition Reform Society was held on Wednesday evening last at 9, Conduit Street, W., the chair being occupied by Mr. J. S. Gibson. After the minutes of the previous meeting had been read and confirmed, it was resolved to amend rule 3 as follows: "The committee shall consist of chairman, vice-chairman, hon. secretary, assistant hon. secretary, five metropolitan members, and two representatives from each of the provincial and allied societies who may desire to be represented, all of whom are to be elected annually. The committee shall be empowered to admit new members, &c." Formerly the committee consisted of nine members, but by thus increasing the number so as to include representatives of the provincial and allied societies it is hoped to make the Society much more influential. It was further resolved to revise the form of application for membership. This now reads as follows: "I desire to become a member of the above Society, and if elected will conform to the rules. And will further agree not to take part in any open competition the conditions of which do not meet with the approval of the committee of this Society, and notice of which disapproval has been sent to me." The chairman explained that unless the members bound themselves in this manner the whole object of the Society would be defeated. Mr. Kaye Parry, hon. secretary of the Institute of Architects of Ireland, mentioned the case of a Dublin competition the conditions of which were not considered satisfactory. The Institute notified its members of the fact, with the result that none of them submitted plans and the competition collapsed.

The suggestion was brought before the meeting to send out circulars and copies of the Society's rules to architects who were not members of the R.I.B.A. It was decided, however, to defer doing so for the present, on grounds of finance. Mr. Henry A. Saul was then elected hon. secretary of the Society in place of Mr. H. W. Wills (who had resigned), after which Mr. C. E. Hutchinson, assistant hon. secretary, referred to the table which is given on the opposite page.



CARVED OAK PANEL, HENRY VII.'S CHAPEL, WESTMINSTER ABBEY.
MEASURED AND DRAWN BY P. E. STRONG.

furniture and fittings. The time occupied in reconstruction will extend over a period of about six years. The area occupied by buildings will be practically the same as that of the selected plans submitted by the architects in the competition of 1896, though the scheme has been entirely re-cast. On the surgical side provision is made for 176 men and 97 women, and on the medical side for 115 men and 64 women. Accommodation is provided for 162 nurses and servants. A new type of ward for the top floors has been designed. The general section is that of a barrel-vaulted roof with continuous top light, but with sufficient windows to afford out-look for patients and do away with the im-

accommodates 250 students. A separate department has been arranged for the reception of Hebrew patients, if such be required. The accident department forms an entirely distinct group. The elevations have now been entirely re-designed with a view to more adequately adorning so fine a site.

The Oak Panel illustrated above is one of four in front of the stalls on either side of the entrance to Henry VII.'s Chapel, Westminster Abbey. It is a good example of the late Gothic work in which the whole chapel is carried out, the peculiar grotesque leaves being particularly typical.

SUMMARY OF TWENTY-TWO COMPETITIONS DURING 1902.

Competition.	Assessor, Appointed or not.	Award.	Premium.	Percentage of Premium on Total Cost.	Designs to become Property of Council.	Commission.	Remarks.
Norfolk and Suffolk Yacht Club.	Yes.		1. £25 2. 20 3. 15 £60	Cost £4,200 Percentage = $1\frac{1}{2}$			
Chorlton and Manchester Asylum.	Yes.	By Committee with Assessor's assistance.	1. £200 2. 150 3. 100 £450	Cost not stated.	All premiated.		
Liverpool Infirmary for Children (4 to 6 invited).	Yes.	Ditto ditto.	£50 each.	Ditto.		$7\frac{1}{2}$ per cent. for architectural and quantity work, including travelling, &c.	
Aldershot Council Offices, &c.	Yes.	Assessor's award not binding.	1. £100 2. 75 3. 50 £225	Cost £15,000 Equals $1\frac{1}{2}$ per cent.	All premiated.		
Harrogate Town Hall.	Yes.		1. £150 2. 100 3. 75 £325	Cost £40,000.			
Malden and Coombe Public Offices, &c.	Yes.	Assessor's award probably adhered to.	1. £25 (merged) 2. 10 £35	Cost £5,100 Equals about $\frac{1}{4}$ th per cent.	All premiated.		
Oldham Public Baths.	Yes.	Committee will place in order of merit the three designs Assessor selects.	1. £20 (merged) 2. 15 3. 10 £45	Cost £7,000 About $\frac{1}{3}$ rd per cent.	All premiated.	5 per cent. inclusive.	
Sunderland Police and Fire Stations.	Yes.	Corporation will adopt any design they may think fit.	1. £100 (merged) 2. 50 3. 25 £175	Cost £35,000 About $\frac{1}{4}$ th per cent.	All premiated.	5 per cent. inclusive.	$\frac{1}{4}$ th scale drawings and alternative scheme asked for.
York Victoria Memorial.	No.		£50 (merged)	Nil.			
Harrogate and Knaresboro' Isolation Hospital.	Yes.	Assessor's award not binding	1. £100 (merged) 2. 50 £150	Cost about £15,000 About $\frac{1}{3}$ rd per cent.		5 per cent. inclusive.	
North Staffordshire Eye Hospital.	Reserve the right to appoint assessor.	Committee will accept that which in their opinion is best to meet their requirements.	None.	Nil.			
West Hartlepool School Board.	Yes.	Board reserves the right to appoint the author of any design they may think fit.	1. £75 (merged) 2. 35 £110	Cost £18,000 About $\frac{1}{4}$ th per cent.	All premiated.	5 per cent. inclusive.	$\frac{1}{4}$ th scale drawings, 4 elevations, 2 sections plans and roof: $\frac{1}{10}$ th site plan.
Crewe Municipal Offices.	Doubtful.	Will appoint first premiated if capacity can be proved.	1. £50 2. 25 £75	Cost £12,000. About $\frac{1}{3}$ th per cent			
Deptford Town Hall and Offices.	Yes.	Will appoint first premiated.	1. £100 (merged) 2. 75 3. 50 £225	Cost £30,000 Slightly more than $\frac{1}{3}$ rd per cent.		5 per cent., travelling expenses allowed extra.	
Liverpool Labourers' Dwellings.	Yes.	Assessor's award not binding.	1. £250 (merged) 2. 150 3. 100 £500	Cost not stated.	(All plans, documents, &c., to be handed over at completion.)	5 per cent. inclusive.	If cost over 10 per cent. of estimate, no premium, no claim.
Tottenham Municipal Buildings, Fire Station, &c.	Yes.	Assessor's award not binding.	1. £200 (merged) 2. 100 3. 50 £350	Cost £55,000 Slightly more than $\frac{1}{4}$ th per cent.			Number of drawings and scale excessive; alternative schemes.
Southend Church Extension.	Yes.	Binding	None.	Nil.		Usual terms.	
Great Clacton School Board.	No.		None.	Nil.			
Bermondsey Working-Class Dwellings.	Yes.	Binding as to premiums	1. £100 2. 60 3. 40 £200	Cost not stated.	All premiated.	5 per cent. inclusive.	No premium if cost over 10 per cent. of estimate.
Kirkcaldy Burgh School Board.	No.		None.	Nil.		4 per cent.	
Bucks War Memorial.	No.		None.	Nil.		Not stated.	
Lord Armstrong Memorial.	Yes.	Not binding to accept any of the designs.	1st competition, Three at £25 = £75 2nd competition, (at least three to be chosen). 1st (work to carry out). 2nd 75 3rd 50 £200	Cost £5,000. 4 per cent. on cost. $4\frac{1}{4}$ per cent. if not carried out.			

Builders' Notes.

Deaths of Builders.—Mr. John Pendlebury, builder and contractor, of Bradford, Manchester and Blackpool, died recently at the age of sixty-two years.—Mr. Alfred Styan, builder, of Whitley Bay, died recently at the age of sixty-two years.

A Plumber causes Explosion.—A plumber who had mended a pipe at the Moot Hall, Newcastle, last week lighted a match to see whether all was right. This was immediately followed by an explosion, and several windows were blown out and the plumber was seriously injured.

The New Admiralty.—An arbitration of some importance will shortly take place between the Commissioners of Works and Messrs. Chessum & Sons, the contractors, for excavating the foundations of the new Admiralty Offices, which are to be erected in the rear of the existing buildings in Whitehall. The contractors' claim is for extra work.

Building at Handsworth.—Handsworth is experiencing another building boom. Nearly 800 houses have been erected or at present are in course of erection, and the end is not near yet, for quite a number of plans for streets of houses are being prepared. An important scheme of church and chapel extension is also in progress, and the outcome of this will be the erection of something like a dozen new churches and chapels.

A Serious Scaffold Accident occurred at Wood Green last week. Several workmen were engaged on the roof of St. Michael's Church, which is in course of erection, when the scaffold on which they were collapsed. The men fell a distance of about 40ft., and one of them had several ribs broken and sustained some internal injuries. He was removed to hospital, where he lies in a critical condition. The others escaped with a severe shaking.

The Jewish Synagogue in course of erection in Boundary Road, Walthamstow, has been for two days in a state of siege. The builder who had contracted to erect the building, and who had been furnished with notice to quit the premises, had his tools put outside the fence. A new builder was engaged, but he and his men were attacked by thirty men employed by the ejected builder, and were forced to surrender. The new builder succeeded in the afternoon in again obtaining possession of the premises, and at night he and his men paced the space around the synagogue, while the police kept back the crowd outside.

A Year's Building in Leeds.—The annual report of the work done under the supervision of the Building Plans Committee of the Leeds Corporation states that of 2,677 plans that came before the committee up to the year ending 25th March last 2,082 were approved, and these provided for the erection of 7,828 buildings. The corresponding figures in the previous municipal year were 2,199 and 8,954, while for the year ending March, 1900, they were 2,169 and 9,439. The 2,082 plans sanctioned in the past year include 486 plans for houses, 809 for the extension and alteration of other buildings, 440 for mills, warehouses, stables, sheds and workshops, and 74 for new streets. On the house plans there were 2,635 dwellings, consisting of 18 villas, 140 semi-detached villas, 728 through houses and 1,749 back-to-back houses. The number of houses completed and certified for occupation has been 2,201, consisting of 17 villas, 55 semi-detached villas, 771 through houses and 1,358 back-to-back houses. Amongst the 2,020 miscellaneous buildings completed were one mission church, four chapels, three mission-rooms, three schools, a parochial hall, a temperance hotel, four hotels, the rebuilding of five hotels, three banks, two restaurants, one club, a masonic hall, a pupil-teachers' college, one library, a police-station, a drill hall, a laundry, the entrance lodge to Kirkstall Abbey, two factories, a mortuary, one assurance office and a steam turbine works.

London County Council.—At last week's meeting of the Council Dr. Longstaff (chairman of the Building Act Committee), replying to a question by Mr. Lewin Sharpe in regard to the Avenue Exchange premises of the National Telephone Co. in Lime Street, said: The "company occupy part of the third floor and the whole of the fourth and fifth floors. On the fifth floor, used as a trunk line, nine males are

employed. On the fourth floor, used as a central telephone exchange, eighty females are employed. On the third floor is a mess-room, and a motor for supplying electricity. As regards the means of escape, there is a 4ft. brick enclosed stone staircase in the east angle of premises connected with the basement, ground, third and fourth floors only. The doors to the staircase are ordinary deal doors. From the fourth floor there is a spiral iron staircase up to the fifth floor, and a similar staircase down to the lighting area to the third floor. The windows on the third and fourth floors are fixed iron sashes, and would not be available for escape. The premises do not appear to come within the scope of section 14 of the Factory and Workshops Act of 1901, and cannot, therefore, be dealt with by the Council. They have not been reported by the Home Office." Mr. Lewin Sharpe further asked whether, in view of the serious state of affairs, the chairman of the committee would cause a communication to be addressed to the National Telephone Co. calling attention to their responsibility, and the Council's irresponsibility. Dr. Longstaff said his committee would carefully consider both matters.—The General Purposes Committee recommended the appointment of Mr. G. W. Humphreys as manager of the Works Department at a salary of £1,200. This was agreed to.—On the recommendation of the Highways Committee it was agreed that, in view of the probability of proposals for tube railways and other schemes for London locomotion being submitted to Parliament next session, the committee should be authorised to seek a conversation with the President of the Board of Trade with a view of urging upon him the desirability of the establishment of some statutory authority to deal with all proposals relative to locomotion in London.

FIRE TEST WITH A JARRAH FLOOR.

PUBLICATION No. 71 of the British Fire Prevention Committee relates to a fire test with a floor of jarrah wood by Millars' Karri and Jarrah Forests, Ltd., London. In a note on the test Mr. Max Clarke says: "The difference of opinion is great amongst experts as to whether the best fire-resisting construction should be of wood or steel, and whether buildings should be of a 'fire-resisting' or 'slow-burning' type. These are not matters which will be settled off-hand; but there is no doubt that the work of the Committee tends to a solution of most of them in time."

The floor in question was constructed of jarrah in the following manner:—A post 15in. sq. was placed in the centre of the testing hut standing on a bed of concrete. It was notched at the top to receive cleats to support the cross-beams, which were 10in. by 12in. On these beams four joists 10in. sq. were placed, spaced 2ft. 6in. apart, and on these 8½in. by 2½in. boards were laid and spiked. The floor was 10ft. by 22ft. 3in., and was loaded with 232lbs. per sq. ft., distributed. The following is a summary of the effect of the fire, which lasted two hours, the temperature gradually increasing to 2,000 degs. Fahr.:—In 16 minutes some of the joints on the underside of the flooring were opening. In 17 minutes smoke appeared through a joint of the flooring. In 69 minutes the underside of the flooring was burnt and flaked off, so that the rebated joints were visible in many places. In 84 minutes flame came through the flooring. In 119 minutes there were numerous holes in the floor with flames coming through them, considerable portions of the flooring being burned away from under the stacks of bricks used as loading. The post, beams and joists were reduced in size and charred to a depth of ¾in.

A New Infectious Diseases Hospital at Skipton has been erected on the slope of Cawdor Hill at a cost of £16,000. There is accommodation for forty-two patients. There are two scarlet-fever blocks, each containing fourteen beds, and the typhoid-fever block contains ten beds. There is an isolation block, with four separate wards, containing one bed each. The wards are divided into two sections, and diphtheria or other infectious complaints can be isolated therein.

Masters and Men.

The Burton Operative Masons having refused the masters' offer to refer their wages dispute to a conciliation board to be represented by both sides, came out on strike last week, and as neither employers nor employed seem inclined to give way the struggle is likely to be of a prolonged character. The demand on the part of the men, which was made six months ago, is for an advance in wages from 8½d. to 9½d. per hour. They also ask that walking time should be allowed from the Midland station to country jobs instead of outside the proposed two miles' circle, as in the case of other branches of the building trade. The dispute affects about eighty men, all of whom are members of the masons' union, which, however, appears to be the only trade society not affiliated with the Burton Trades' Council.

Midland Master-Builders.—The members of the Midland centre of the National Federation of Building Trade Employers held their half-yearly meeting last week at Birmingham, under the presidency of Mr. William Sappcote (Birmingham). Mr. H. Smith (Kidderminster) reported that the bricklayers at Kidderminster were still on strike, and were doing all they possibly could to prevent non-union men from following their employment in a peaceable manner. All through the dispute the employers had been prepared to submit the questions at issue to the arbitration of the Board of Trade, but the men had stubbornly refused this and were doing their best to prevent those willing and anxious to work from doing so. The secretary, Mr. A. E. Tallis, said that he was in communication with Mr. Batchelor (general secretary of the Operative Bricklayers' Society) with a view to bring about a settlement of the dispute under the Conciliation Act, 1896. Mr. Batchelor had written that he hoped the matter might be amicably arranged. There was, however, considerable local friction, and from his (Mr. Tallis's) knowledge of the circumstances there seemed small chance of a settlement being arrived at through the appointment of a local arbitrator. An arbitrator appointed by the Board of Trade would be untouched by local bias, and the employers were quite prepared to abide by the decision of such an arbitrator. It was resolved that the executive of the Operative Bricklayers' Society should be further requested to use their influence to settle the dispute by conciliatory means. A report was also presented stating that the operative stonemasons at Burton-on-Trent had struck work because the employers had declined to grant an increase of wages. Here again the employers had offered to let the matter be settled by arbitration, and had suggested the executives of the Midland Federation and the Operative Masons' Society as best fitted to deal with the dispute. Both these offers had been ignored by the men, and they had deliberately struck work. A report was received from Leicester stating that the society carpenters there were again raising a difficulty by refusing to fix ready-made joinery unless it came from establishments they liked to name. It was stated that the action of the men really amounted to dictating where an employer should purchase his material, and was most unreasonable. Several speakers urged that under recent legal decisions in the High Court it was clear that if the operatives deliberately conspired to injure a firm, by refusing to fix their goods when purchased by a builder, it ought not to be a difficult matter to proceed against the Carpenters' Society for damages. Mr. J. Wright (Nottingham) said that he could scarcely believe the executive of the Carpenters' Society would support the conduct of their members at Leicester. It was a fact that the Amalgamated Society of Carpenters and Joiners had issued a special warning to their branches against doing anything which might render the funds of their organisation liable, and it looked very much as though at Leicester the society men were ignoring that warning and jeopardising the funds of their organisation. The employers very strongly objected to this kind of tyranny. Several other matters of trade importance were also discussed, including the general adoption of one form of contract throughout the country.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:				
July	10	Aberystwyth—Stone Screen	University College	T. E. Morgan, 12 Baker Street, Aberystwyth.
"	10	Abercynon, Wales—Fourteen Cottages	Western Valleys Cottage Co., Ltd.	E. Williams, Architect, Andrew's Buildings, Cardiff.
"	10	Armagh—Storeroom	Rural District Council	R. H. Dorman, County Surveyor, Armagh.
"	10	Meath, Ireland—Three Labourers' Cottages, &c.	Southwark Gardens	T. Dowdall, Clerk, Council Offices, Meath.
"	10	London, S.E.—Additions, &c., to Workhouse	Hambleton Rural District Council	G. D. Stevenson, 13 & 14 King Street, E.C.
"	10	Cranleigh, Surrey—Cottage	Charity Trustees	F. L. Lunn, 38 High Street, Guildford.
"	10	Fosdyke—Pair of Cottages	Urban District Council	J. Kirkby, Fosdyke.
"	10	Gillingham, Kent—Corrugated Iron Buildings	R. H. Lee & Co.	F. O. Boucher, Clerk, Gardiner Street, New Brompton.
"	10	St. Austell, Cornwall—Alterations, &c., to Premises	Bolckow, Vaughan & Co.	T. H. Andrew, 19 Trevanick Villas, St. Austell.
"	10	Bishop Auckland, Durham—200 Workmen's Houses	Sevenoaks Rural District Council	I. A. Derwent, 10 Danesbury Terrace, Partington.
"	10	Birkenshaw—Sunday School	J. Gittins	Walker & Collinson, Architects, Swan Arcade, Bradford.
"	10	Thornton—Twenty-nine Houses	Union Guardians	M. Hall, 29 Northgate, Halifax.
"	11	Penshurst—Eight Workmen's Cottages	Union Guardians	F. Taylor, 26 Temple Street, Aylesbury.
"	11	Dolafondnd, near Cemaes Station—Farmhouse	Rural District Council	R. L. Jones, Architect, Mount Place, Bala.
"	11	Newcastle-on-Tyne—Alterations at Elswick Grange	Standing Joint Committee	Oliver, Leeson & Wood, Architects, Mosley Street, Newcastle.
"	11	Newcastle-on-Tyne—Alterations to Hospital Ward	Urban District Council	Newcombe & Newcombe, 89 Pilgrim Street, Newcastle-on-Tyne.
"	11	Cubley, Derby—Bridge	School Board	J. Barker, Surveyor, Cubley.
"	11	High Harrington, Cumberland—Pair Semi-Detached Dwellings	Bank of Liverpool, Ltd.	J. Eden, 68 Bow Street, Workington.
"	11	Uttoxeter, Staffs—Cells and Additions, &c., to Police Station	Cottage Co., Ltd.	W. H. Oheadle, County Surveyor, Stafford.
"	11	East Molesey—Alterations to Building	Corporation	Surveyor, Dundee Villa, St. Mary's Road, East Molesey.
"	12	Cardigan—Additions, &c., to Chapel	Corporation	No. 11 High Street, Cardigan.
"	12	Halifax—Stabling, &c.	City Council	R. Horsfall & Son, 22A Commercial Street, Halifax.
"	12	Bisley, Surrey—School	School Board	A. J. Sturges, Architect, High Street, Guildford.
"	12	Shirland—Additions to School	Workhouse Guardians	Rollinson & Son, 13 Corporation Street, Chesterfield.
"	12	Milom, Cumberland—Bank Premises	Sanatorium Committee	J. F. Curwen, 26 Highgate, Kendal.
"	12	North Ashton—Alterations, &c., to Schools	Ystradyfodwg School Board	J. W. Leversedge, Architect, Wigan Road, Ashton-in-Makerfield.
"	12	Miskin, Mountain Ash—Thirty-seven Cottages	Easing Town Council	T. W. Millar, Architect, Mountain Ash.
"	12	Blackpool—Stables	Town Council	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
"	14	Glasgow—Fazaar Extension	Union Guardians	A. B. McDonald, City Engineer, City Chambers, Glasgow.
"	14	Bristol Docks, Avonmouth—Additions to Cattle Lairs	Corporation	W. W. Squire, Engineer, Cumberland Basin, Bristol.
"	14	Hemington Grey, Hunts—School and House, &c.	School Board	G. G. G. Wheeler, Clerk, St. Ives, Hunts.
"	14	Canterbury—Works to Dormitory	Workhouse Guardians	G. Smith, 34 Station Road, Canterbury.
"	14	Hull—School of Art	Corporation	Lanchester, Stewart & Rickards, 1 Vernon Place, Bloomsbury Sq.
"	14	Middlesbrough—Three Brick Annexes to Hospital Wards, &c.	Sanatorium Committee	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
"	14	Porth—School	Aston Union Guardians	J. Rees, Architect, Hillside Cottage, Pentre.
"	14	London, W.—Cements, &c.	Lancs County Council	O. Jones, Borough Surveyor, Town Hall, Ealing, W.
"	14	Boston—Municipal Buildings	School Board	J. Rowell, Architect, Borough Offices, Market Place, Boston.
"	14	Bradford—Workhouse Buildings	Town Council	Empsall & Clarkson, 7 Exchange, Bradford.
"	14	Oxford—Storage Reservoir and Gas Engine House	London County Council	W. H. White, City Engineer, Oxford.
"	15	London, S.W.—Alterations, &c., to Tramways Depot	School Board	Architect's Dept. (General Section), 19 Charing Cross Road, W.C.
"	15	Hastings—Technical School	Committee	A. W. Jeffery, 5 Havelock Road, Hastings.
"	15	Cockington—Church Completion	North-Eastern Railway Co.	Nicholson & Corlette, 2 New Square, Lincoln's Inn, W.C.
"	15	Birmingham—Alterations to Office, &c.	Metropolitan Asylums Board	O. Whitwell, 23 Temple Row, Birmingham.
"	15	Shillingstone, Dorset—Reconstructing Bridge	Sewerage Committee	County Surveyor, Wimbome.
"	15	Baltic—Parish Institute	St. Pancras Guardians	Bedford & Kitson, Architects, Greek Street Chambers, Leeds.
"	15	Ashton-in-Makerfield—Police Station	School Board	H. Littler, Architect, County Offices, Preston.
"	15	Brighton—Repairs, &c. to School	Town Council	T. Simpson & Son, 17 Ship Street, Brighton.
"	15	Porth Glasgow—Refuse-Destructor Buildings	Union Guardians	S. Tough & Alexander, 2 Hamilton Street, Greenock.
"	16	East Greenwich—Organ Chamber, &c.	Market Committee	A. Roberts, 18 Nelson Street, Greenwich.
"	16	Knighton & Wembury Ford near Plymouth—Wall, &c.	School Board	F. W. Cleverton, 4 Buckland Terrace, Plymouth.
"	16	Thornton, Yorks—Twenty-nine Houses, &c.	Guardians	M. Hall, 29 Northgate, Halifax.
"	16	Leeds—General Offices	Caledonian Railway Company	W. Bell, Company's Architect, York.
"	16	Leeds—Premises	School Board	Bedford & Kitson, Greek Street Chambers, Leeds.
"	16	Carshalton, Surrey—Convalescent Hospital	Urban District Council	Treadwell & Martin, 2 Waterloo Place, Pall Mall, S.W.
"	17	Leeds—Cement	Metropolitan Asylums Board	City Engineer, Leeds.
"	17	London, N.W.—Coach-house and Stabling	Sewerage Committee	A. E. Pridmore, 2 Broad Street Buildings, E.C.
"	17	Falmouth—Classroom	St. Pancras Guardians	W. Jenkins, 39 Church Street, Falmouth.
"	17	London, N.W.—Boundary Wall, &c.	School Board	O. E. Winter, Town Hall, Haverstock Hill, Hampstead.
"	18	Belfast—Public Attoir	Hampstead Borough Council	City Surveyor, Belfast.
"	18	Sherborne, Dorset—Repairing, &c., Police Station	Market Committee	E. A. Fooks, Clerk to Standing Joint Committee, Sherborne.
"	18	Bala—Schools	School Board	R. L. Jones, Architect, Station Road, Bala.
"	21	North Evington, Leicester—Infirmary	Guardians	Giles, Gough & Trollope, 28 Oraven Street, Charing Cross, W.C.
"	21	Glasgow—Extension of Central Station Hotel	Caledonian Railway Company	J. Miller, 15 Blythswood Square, Glasgow.
"	22	Balderton, near Newark—School	School Board	Saunders & Saunders, Architects, Arcade Chhrs., Newark-on-Trent.
"	23	Aldershot—Stables, Cart Sheds, &c.	Urban District Council	N. F. Dennis, Surveyor, Aldershot.
"	23	Carmarthen—Boiler and Engine House	Union Guardians	Clerk, Joint Counties Asylum, Carmarthen.]
"	23	Lewes—Board Room and Offices	St. Pancras Guardians	H. Card, 10 North Street, Lewes.
"	26	London, N.—Coach-house and Stabling, &c.	Race Stand Co., Ltd.	A. E. Pridmore, 2 Broad Street Buildings, London, E.C.
Aug.	1	Carlisle—Grand Stands, &c.		J. Graham, Architect, Bank Street, Carlisle.
ENGINEERING:				
July	10	Castleford—Main Laying	Urban District Council	W. Green, Surveyor, Council Offices, Castleford.
"	10	Potterhamworth, Lincs—Water Supply Works	Branston Rural District Council	J. Clare, Engineer, Sleaford.
"	10	Chippenham—2 Steam Rollers	Rural District Council	A. H. Lapham, Surveyor, Oorsham.
"	12	Teddington—Electric Lighting Scheme	Urban District Council	G. H. Salmons, Clerk, Elmfield House, Teddington.
"	12	Lowestoft—Tramways	Corporation	W. O. C. Hawtayne, 9 Queen Street Place, London, E.C.
"	14	Exeter—Steel Arch Bridge over River	City Council	Sir J. W. Barry & Partners, 21 Dalahy Street, Westminster.
"	14	Falkirk—Electrical Plant	Corporation	Burattal & Monkhouse, 14 Old Queen Street, Westminster, S.W.
"	14	Leicester—Gasholder	Gas and Electric Lighting Committee	A. Colson, Engineer, Offices, Millstone Lane, Leicester.
"	14	Aylesbury—Filter Beds, &c.	Rural District Council	F. B. Parrotte, 16 Bourbon Street, Aylesbury.
"	14	Oxford—Reservoir and Gas-engine House	Corporation	W. H. White, City Engineer, Oxford.
"	14	Stockton—Bridge	Rural District Council	W. Burton, Highway Surveyor, Billingham.
"	15	Shillingstone, Dorset—Reconstructing Bridge	Urban District Council	County Surveyor, Wimbome.
"	15	Barking, Essex—Tramways	London County Council	E. H. Lister, Clerk, Public Offices, Barking.
"	15	Southend, Kent—Reconstructing and Widening Bridge	District Council	Engineer's Department, County Hall, Spring Gardens, S.W.
"	15	Portsmouth—Repairs to Pumps, &c.	District Drainage Board	Borough Engineer, Town Hall, Portsmouth.
"	15	Padiham—Steam Fire Engine	Urban District Council	Mr. Gregson, District Engineer, Council Offices, Padiham
"	15	Birmingham—Land Drainage	Urban District Council	J. D. Watson, Engineer, Tyburn, near Birmingham.
"	16	Skelmersdale—Borehole, Deepening Well, &c.	London County Council	J. T. Wood, 3 Cook Street, Liverpool.
"	18	London, S.W.—Electric Cranes	London County Council	County Hall, Spring Gardens, S.W.
"	18	London, S.W.—Cable Ducts	London County Council	County Hall, Spring Gardens, S.W.
"	18	London, S.W.—Electric Tramways	London County Council	County Hall, Spring Gardens, S.W.
"	18	Bombay—Providing and Laying Steel Rails	Corporation	Executive Engineer, Bombay.
"	16	Obeltenham—Waterworks	Metropolitan Asylums Board	J. Hall, Waterworks Engineer, Municipal Offices, Obeltenham.
"	16	Dartford—Laundry Plant	Urban District Council	T. D. Mann, Clerk, board's Offices, Embankment, E.C.
"	17	Gillingham, Kent—Electrical Plant	Urban District Council	W. H. Trentham, 39 Victoria Street, Westminster, S.W.
"	17	Epsom—Electrical Plant	Urban District Council	E. G. Wilson, Clerk, Council Offices, Epsom.
"	19	Matlock—Drivng Adit	Urban District Council	J. Diggle, Engineer, Town Hall, Matlock.
"	21	Newcastle-upon-Tyne—3 Boilers, &c.	Royal Victoria Infirmary	W. Sutton, jun., Prudential Buildings, Mosley Street Newcastle.
"	23	Motherwell, Scotland—Waterworks	Town Council	J. McMillan, jun., Engineer, Culter Waterhead, B ggar.
"	23	Devon—Electric Lighting Plant	County Asylum	O'Gorman & Cozens-Hardy, 82 Victoria Street, Westminster.
"	23	Sydney—Street Electric Lighting	Urban District Council	Preece & Cardew, 8 Queen's Gate, Westminster, S.W.
"	24	Southborough, Kent—Pumping Station		G. & F. W. Hodson, Engineers, Loughborough.
"	25	Londonderry—Heating	North-Eastern Railway Co.	R. E. Buchanan, Engineer, Castle Street, Londonderry.
"	25	Sydney, Australia—Electric Cables, &c.	Corporation	Deputy Postmaster-General, Brisbane.
"	31	Staddithorpe, Yorks—Widening Railway	War Office	W. J. Oudworth, Company's Engineer, York.
"	31	Ramsgate—Sea-Defence Works		T. C. Taylor, Borough Surveyor, Albion House, Ramsgate.
"	31	London, S.W.—Self-propelled Lorry		Director of Army Contracts, War Office, Pall Mall, S.W.
Sept.	1	Valparaiso, Chile—Electric Tramways		Chilian Consulate, '0 Lime Street, E.C.
"	14	St. Petersburg, Russia—2 Bridges over River Neva		The Delegation municipale, st. Petersburg.

COMPLETE LIST OF CONTRACTS OPEN—continued

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
ENGINEERING—cont.:			
Sept. 15	Launceston, Tasmania—Electric Power Transmission Extensions.	Mayor and Aldermen	J. Terry & Co., 7 Great Winchester Street, E.C.
" 15	Cairo—Widening Canal	Ministry of Public Works	Inspector of Irrigation, Projects Circle, Minia.
" 30	Port Adelaide, South Australia—Harbour	—	Agent-General for South Australia, 1 Crosby Square, London.
IRON AND STEEL			
July 10	Glasgow—Railway	Corporation	Office of Public Works City Chambers, 64 Cochrane St., Glasgow.
" 10	London, S.W.—Steel Cables	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 10	Salford—Wrought iron and Steel, Bolts, Castings, &c.	Gas Committee	Gas Engineer, Bloom Street, Salford.
" 10	Newcastle-on-Tyne—Tramway Rails &c.	Corporation	City Engineer, Town Hall, Newcastle-on-Tyne.
" 11	Manchester—Iron, Steel and Files, Nails, &c.	Ship Canal Co.	Stores Department, Manchester Docks, Trafford Road, Salford.
" 14	Birmingham—Pipes	District Drainage Board	J. D. Watson, Engineer, Tyburn, near Birmingham.
" 14	London, E.C.—Railway Stores	Madras Railway Co.	J. Byrne, 61 New Broad Street, E.C.
" 14	London, W.—Ironmongery Castings, &c.	Ealing Town Council	C. Jones, Borough Surveyor, Town Hall, Ealing.
" 15	Heywood, Lancs—Tubes and Fittings	Gas Committee	W. Whatmough, Gas Manager, Municipal Buildings, Heywood.
" 16	Cheltenham—Cast-iron Water Main	Corporation	J. Hall, Waterworks Engineer, Municipal Offices, Cheltenham.
" 17	Leeds—Castings	Sewerage Committee	City Engineer, Leeds.
" 21	Addlestone, Chertsey—Cast-iron Pipes, &c.	Urban District Council	W. H. Radford, Albion Chambers, King Street, Nottingham.
PAINTING AND PLUMBING			
July 10	Salford—Lead Pipe, Paint, Red and White Lead, &c.	Gas Committee	Gas Engineer, Bloom Street, Salford.
" 10	Toft Hill—Renovating and Decorating Chapel	—	B. Raine, High Etherley.
" 11	Manchester—White Lead, Oil, &c.	Ship Canal Co.	Stores Department, Manchester Docks, Trafford Road, Salford.
" 11	Cork—Painting Works	—	J. F. McMullen, Architect, Cork.
" 12	Roscommon, Ireland—Painting at Workhouse	Guardians	T. J. O'Keefe, Clerk, Union Offices, Roscommon.
" 14	Manchester—Painting	Libraries Committee	City Architect, Town Hall, Manchester.
" 14	Workington—Painting, &c., Schools	School Board	G. B. McKay, Clerk, School Board Offices, Workington.
" 14	York—Painting, &c.	Corporation	A. Orer, City Engineer, Guildhall, York.
" 14	London, E.C.—Lead, Paints, Brushes, Varnishes, &c.	Madras Railway Co.	J. Byrne, 61 New Broad Street, E.C.
" 14	Tooting, S.W.—Painting, &c., Cemetery Chapel, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Lambeth Town Hall, Kennington Green, S.E.
" 15	Brighton—Painting, &c., Schools	School Board	T. Simpson & Son, 17 Ship Street, Brighton.
" 15	London, W.—Painting at Infirmary	Paddington Guardians	E. H. Sim, 8 Craig's Court, Charing Cross, S.W.
" 16	Ipswich—Painting, Decorating, &c., Schools	School Board	J. H. Hume, Clerk, Tower House, Tower Street, Ipswich.
" 16	Donabate, Co. Dublin—Plumbing	Richmond District Asylum Committee	G. O. Ashlin, 7 Dawson Street, Dublin.
" 16	Chartham Downs, near Canterbury—Repairs, Painting	Kent County Lunatic Asylum	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
" 18	Colchester—Cleaning and Painting at Schools	School Board	C. E. Denton, Clerk, Board's Offices, Colchester.
" 21	Darlington—Painting, &c., at Schools	School Board	F. R. Stevenson, Clerk, Houndgate, Darlington.
ROADS AND CARTAGE			
July 10	Bishop Auckland—Street Works, &c.	—	I. A. Derwent, 19 Danesbury Terrace, Darlington.
" 10	London, N.E.—Street Works	Hackney Borough Council	N. Scorgie, Borough Surveyor, Town Hall, Hackney, N.E.
" 10	Stockport—Street Works	Highways and Sewers Committee	J. Atkinson, Borough Surveyor, St. Petersgate, Stockport.
" 10	Gillingham, Kent—Kerbing, &c.	Urban District Council	F. O. Boucher, Clerk, Gardiner Street, New Brompton.
" 10	Gillingham, Kent—Materials	Urban District Council	F. O. Boucher, Clerk, Gardiner Street, New Brompton.
" 11	Stapleford, Nottingham—Street Works	Rural District Council	F. R. Hawley, Surveyor, Wood Street, Ilkeston.
" 12	Halesworth, Suffolk—Pavement, &c.	Urban District Council	C. H. White, Clerk, Halesworth.
" 12	Caeracra, Down—Forming and Draining Roads	R. Davies	W. Dowdeswell, Architect, Treharris.
" 12	Horsham—Steam Rolling	Rural District Council	Mr. Denzate, 58 Park Street, Horsham.
" 12	Blackpool—Granite Steps, &c.	Highway Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
" 14	London, W.—Granite &c.	Ealing Town Council	C. Jones, Borough Surveyor, Town Hall, Ealing, W.
" 14	Hale, Cheshire—Making-up Road	Urban District Council	F. J. Lobley, Surveyor, Council Offices, Ashley Road, Hale.
" 14	Leamington—Materials	Corporation	Borough Engineer, Town Hall, Leamington.
" 14	London, N.W.—Improvement Works	Hendon Urban District Council	S. S. Grimley, Engineer, Council Offices, Hendon, N.W.
" 15	Tipton—Paving Footpaths	Urban District Council	W. H. Jukes, Surveyor, Public Offices, Tipton.
" 16	Brentford—Making-up	Urban District Council	N. Parr, Surveyor, Clifden House, Boston Road, Brentford.
" 16	Rochester—Materials	Corporation	W. Banks, City Surveyor, Rochester.
" 17	Harwich—Road Works	Town Council	H. Ditcham, Borough Surveyor, Harwich.
" 21	Aldershot—Making-up, &c.	Urban District Council	Surveyor, Council Offices, Aldershot.
" 24	New Barnet—Making-up	Urban District Council	H. York, Surveyor, Station Road, New Barnet.
" 25	Little Sutton, Cheshire—Lane Construction	Wirral Rural District Council	T. Davies, 33 Kingsland Road, Birkenhead.
" 25	Lewes—Materials for Paving	Town Council	Borough Surveyor, Town Hall, Lewes.
" 31	Wanstead, Essex—Paving	Urban District Council	C. H. Brassey, Surveyor, Council Offices, Wanstead.
Aug. 6	Epsom—Making-up	Rural District Council	T. E. Ware, Surveyor, Waterloo Road, Epsom.
SANITARY:			
July 10	London, S.E.—Reconstructing Drainage, &c.	Southwark Union Guardians	G. D. Stevenson, 13 & 14 King Street, Oneapside, E.C.
" 10	Surbiton—Stoneware Pipe Storm-water Drains	Rural District Council	F. J. Bell, Deputy Clerk, Ewell Road, Surbiton.
" 10	Youghal, Ireland—Sewer, &c.	Rural District Council	F. Ronayne, Exec. San. Officer, Board-room, Workhouse, Youghal.
" 12	Runcorn—Sewerage Works	Rural District Council	W. H. Radford, Engineer, Albion Chambers, Nottingham.
" 12	Penistone, Yorks—Sewerage Works	Urban District Council	W. Spinks, 20 Park Row, Leeds.
" 12	Wakefield—Sewers, &c.	Corporation	R. Porter, City Surveyor, Town Hall, Wakefield.
" 14	London, W.—Limes, Pipes, Disinfectants, &c.	Ealing Town Council	C. Jones, Borough Surveyor, Town Hall, Ealing, W.
" 14	London—Sewer	City Corporation	Surveyor, Guildhall, E.C.
" 15	Eccles, Lancs—Relaying Sewer	Highways Committee	T. S. Picton, Borough Engineer, Town Hall, Eccles.
" 15	Heywood, Lancs—Lime, &c.	Gas Committee	W. Whatmough, Gas Manager, Municipal Buildings, Heywood.
" 15	Bingley, Yorks—Removal of Nightsoil, &c.	Urban District Council	A. Platts, Clerk, Town Hall, Bingley.
" 15	London, W.—Sanitary Fittings at Infirmary	Paddington Guardians	E. H. Sim, 8 Craig's Court, Charing Cross, S.W.
" 15	London, E.C.—Sewer	City Corporation	Engineer, Guildhall, E.C.
" 17	Leeds—Earthenware Pipes, &c.	Sewerage Committee	City Engineer, Leeds.
" 17	Leeds—Lime	Sewerage Committee	City Engineer, Leeds.
" 18	Thrupp, near Stroud—Sewers	Stroud Rural District Council	C. S. Cole, Resident Engineer, Bridge House, Ebley, Stroud.
" 21	Chertsey—Sewerage Works (Two Contracts)	Urban District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster.
" 21	Chertsey—Sewerage & Sewage-Disposal Works	Urban District Council	W. H. Radford, Engineer, Albion Chambers, King St., Nottingham.
" 21	Darfield, Yorks—Sewerage Works	Urban District Council	Fairbank & Son, 13 Lendal, York.
" 21	Bournemouth—Sewers	Town Council	F. W. Lacey, Borough Engineer, Bournemouth.
TIMBER:			
July 10	Salford—Timber	Gas Committee	Gas Engineer, Bloom Street, Salford.

COMPETITIONS OPEN

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July 19	Aylesbury—Monument	—	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
" 26	Clacton-on-Sea—Board School	—	C. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprava, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	C. H. J. Talmage, Southchurch Road, Warner Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 16	London, S.E.—Artizans' Dwellings	£100, £60, £40.	F. Ryall, Town Clerk, Bernandsey Town Hall, Spa Road, S.E.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.O. Offices, Tottenham.
" 29	Bideford—Municipal Offices and Public Library	£30, £15, £10.	W. B. Seldon, Town Clerk, 13 The Quay, Bideford.
Nov. 1	Alahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Alahabad, India.
No date.	Montreal, Canada—War Monument to Canadian Soldiers	—	Bank of Montreal, 22 Abchurch Lane, E.C.

TENDERS.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Effingham House, Arundel Street, Strand, W.C.

BADSHOT LEA (near Aldershot).—For proposed new church at Badshot Lea, near Aldershot:—

W. J. Snuggs	£2,967 0
J. Dorey & Co., Ltd., Brentford, Middlesex	2,905 0
W. Garland	2,826 0
W. Watson, Ascot, Berks	2,800 0
S. Ellis, Guildford	2,708 0
Maides & Harper, East Croydon	2,554 0
Martin, Wells & Co.	2,641 0
B. E. Nightingale Lambeth	2,634 0
Goddard & Sons, Farnham	2,590 0
A. G. Marlon, Hall, Farnham	2,545 10
Tompsett & Co., Farnham	2,480 0
G. Kemp, Elm Road	2,459 0
[Rest of Aldershot.]	Accepted.

LEEDS.—Accepted for the erection of Public Baths and Library, York Road, for the Corporation of Leeds, Mr. H. Ascough, Chapman, A.R.I.B.A., architect, Prudential Buildings, Park Row, Leeds:—

Paul Rhodes, Excavator, Bricklayer, & Mason	£10,397 9 9
Banks Mawson, Carpenter & Joiner	3,295 0 0
Pickles Bros., Slaters	326 0 0
T. Moore, Plasterer	463 0 0
G. Thompson, Plumber	1,350 0 0
Perkins & Co., Ltd., Ironfounders	997 15 0
Roylance & Horsman, Painters	243 10 0

Total

[All of Leeds.]

LONDON.—For drainage and sanitary work at Wirtemberg Street School, Clapham, for the London School Board. Mr. T. J. Bailey, architect:—

H. & G. Mallett	£2,110 0 0
G. Parker	2,095 0 0
W. Downs	2,060 0 0
L. Whitehead & Co., Ltd.	2,008 0 0
Johnson & Co.	1,977 0 0
Rice & Son	1,949 0 0
Durbin & Katesmark	1,851 0 0
J. & M. Patrick	1,751 0 0
Lathey Bros.	1,779 0 0
R. P. Beattie	1,706 11
H. Leney & Son*	1,533 0 0

* Recommended for acceptance.

MONAGHAN.—For the following works, for the Urban District Council: construction of a storage reservoir at Pogon, including all excavations, embankments, weirs, intake, chamber, valve pit, fencing, and contingent works; construction of an aqueduct of about 4 miles 6 furlongs in length, consisting of 6-in. and 8-in. cast-iron pipes, with all sluice and air valves, hatch boxes, and other appliances; distribution system through the town and district of Monaghan, with all valves, hydrants, street fountains, &c.; construction of filter-beds, clear-water basin, gauge trough, valve pits, pipelaying connected therewith, fencing, and contingent works; and the maintenance of the whole of the works for 12 months after completion. Messrs. J. L. Devenish Meares, C.E., Town Hall, Newry, and J. H. M. Wilson, C.E., Monaghan, engineers:—

McNally, Cookstown	£7,750 19 1
J. Callan, Castleblayney	7,172 16 1
J. McKie & Sons, Dungannon	6,959 14 2
Hegarty & Gault, Ballymena	6,695 10 4
P. Ritchie, Pacific Avenue, Antrim Road, Belfast	6,625 7 5
J. Graham, jun., Dromore, co. Tyrone	6,607 19 0
W. McLarnon,* 61 Brookvale Terrace, Antrim Road, Belfast	6,157 12 11

* Accepted.

RUSHDEN (NORTHANTS).—For the erection of new premises for drapery, furnishing, and outfitting departments, and co-operative hall in the High Street, Rushden, for the Rushden Industrial Co-operative Society, Messrs. Cooper & Williams, architects, Rushden and Kettering:—

Buckley, Rothwell	£4,005 0
R. Marriott	3,875 0
F. Henson, Finedon	3,850 0
T. Willmott, jun.	3,799 0
G. Henson, Wellingborough	3,745 0
H. Sparrow	3,730 0
Brown & Sons, Wellingborough	3,710 10
Ketterling Co-operative Builders	3,594 0
T. Swindall	3,588 0
T. & C. Berrill, Irchester	3,483 0
Whittington & Tomlin	3,477 0
C. E. Bayes*	3,443 0

* Accepted. Architect's estimate, £3,500. [Rest of Rushden.]

ST. ALBANS.—For the erection of a villa, Verulam Road, St. Albans for Mr. F. Cutmore. Mr. S. Doddimeade Edmunds, architect, 23, Victoria Street, St. Albans:—

J. S. Smith	£470 0 0
C. Dumbleton	383 2 9
Goodchild & Sons*	345 0 0

[All of St. Albans.] * Modified and accepted.

ST. ALBANS.—Accepted for the erection of a villa, Cornwall Road, Priory Park, St. Albans, for Mr. W. Oakley. Mr. S. Doddimeade Edmunds, architect, 23, Victoria Street, St. Albans:—

W. Stevens & Sons, St. Albans

TAVISTOCK.—For the erection of the Gill wing at the Tavistock Cottage Hospital:—

Tozer & Son	£3,116	Pearn Bros.	£1,799
W. H. Hignam	2,993	A. Andrews	2,946
Trevar & Co.	2,920	J. A. Dennis	2,948
P. Blowey	2,885	T. Kerslake	2,993
Berry & Son	2,777	J. Kelley,* Horrabridge ..	2,350
Turpin & Co.	2,702		* Accepted.

WARSOP (NOTTS).—For the erection of certain premises at Warsop Vale, Warsop. Messrs. Vallance & Westwick, White Hart Chambers, Mansfield, architects:—

J. Greenwood, Mansfield	£1,800 0 0
A. Eastwood, Warsop	1,189 2 9
Vallance & Blythe, Mansfield	1,470 0 0
T. Barlow, Nottingham	1,382 0 0
Cahill & Leverton, Worksop	1,300 0 0
C. G. Percival, Mansfield	1,320 0 0
C. Vallance, Mansfield	1,250 0 0
F. Lee, Alfreton	3,893 0 0
T. Cuthbert,* Nottingham	3,893 0 0

* Accepted.

WHITWORTH.—Accepted for alterations and additions to Club Premises for the Whitworth Conservative Association. Northcliffe Mills, architect, 235, Drake Street, Rochdale.

General Contractor—H. Tipping, Market Street, Whitworth. Furnishing—Ashton, Leach, and Cumberbirch, Molesworth Street, Rochdale.

LONDON.—For drainage and sanitary works at Broomsleigh Street School, Hampstead, for the London School Board. Mr. T. J. Bailey, architect:—

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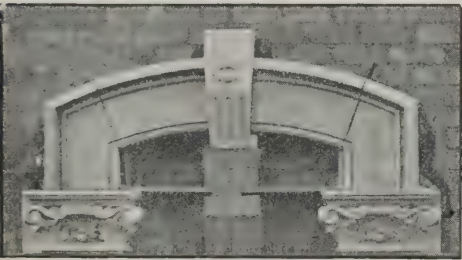
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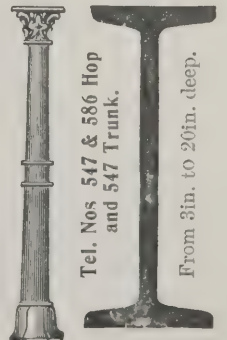
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G. Godson & Sons	2,700 0 0
R. P. Beattie	2,088 6 3
Marchant & Hirst	2,088 0 0
T. Cruwys	2,080 0 0
Stevens Bros.	2,450 0 0

* Recommended for acceptance.

LONDON.—For drainage and sanitary works at Wilton Road School, Dalston, for the London School Board. Mr. T. J. Bailey, architect:—

Lathey Bros.	£1,410 0
E. Triggs	1,300 0
F. Lawrence & Sons	1,382 0
Johnson & Co.	1,370 0
G. S. S. Williams & Son	1,314 0
Stevens Bros.	1,252 0
R. P. Beattie	1,202 14

* Recommended for acceptance.

LONDON.—For drainage and sanitary works at Woolmore Street School, Poplar, for the London School Board. Mr. T. J. Bailey, architect:—

G. Parker	£2,533 0 1
J. Peattie	2,200 0
R. P. Beattie	1,940 7
Johnson & Co.	2,134 0
T. Cruwys	1,595 0

* Recommended for acceptance.

LONDON, N.W.—For the erection of dwellings for the working-class on land in Great College Street, for the St. Pancras Borough

Council. Mr. Keith D. Young, F.R.I.B.A., architect, 17 Southampton Street, Bloomsbury:—

Patman & Fotheringham, Ltd.	£22,015
H. Willcock & Co.	21,000
Martin, Wells, & Co.	10,781
W. J. Renshaw	10,650
Holloway Bros.	10,024
H. Wall & Co.	18,814
E. Lawrence & Sons	18,445
C. G. Hill	£16,204
J. Appleby	18,095
J. Smith & Sons, Ltd.	18,053
Sabey & Son	17,901
L. Whitehead & Co., Ltd.	17,784
Portland Place North, Clapham Road	* Accepted.

LONDON, N.W.—For the construction of public conveniences at South End Green, Hampstead, for the Hampstead Borough Council. Mr. O. E. Winter, A.M.I.C.E., borough engineer:—

T. Adams, Wood Green	£2,978
Killingback & Co., Camden Town	2,747
Meston & Hale, Harlesden	2,694
B. Finch & Co., Lambeth	2,550
Doulton & Co., Lambeth	2,440
R. Ballard, Ltd., Child's Hill	2,437
E. Rogers & Co., Notting Hill, W.	2,413
B. Nightingale, Lambeth	2,341
J. A. Dunmore, Crouch End	2,212
Gardner & Hazell, Canonbury Road, N.	2,204
G. Jennings, Lambeth	2,102
Davis & Bennett, Princes Street, Westminster	2,100
Thomas & Edge, Woolwich	2,067

* Accepted.

LYDNEY (GLOS.).—For the construction of waterworks for the Lydney Rural District Council. Mr. J. Fletcher Trew, C.E., engineer, County Chambers, Gloucester:—

Griffiths, Stonehouse	£2,098
Reading, Wolverhampton	957
Wood, Bristol	853
Riley, Cheltenham	841
Meredith, Gloucester	828
Shardlow, Nottingham	771
Byard, Gloucester	830
King, Gloucester	830
Perkins, Bristol	625
Scull, Bristol	600

[Engineer's approximate estimate, £600.]

Contract No. 2.—Reservoir.

Griffiths	£3,005
Reading	2,639
Riley	2,500
Powell	2,418
Meredith	2,400
Wood	2,330
Byard	2,108
King	1,970
Perkins	1,911
Scull	1,878
Shardlow	1,647

[Engineer's approximate estimate, £1,750.]

Hancock, Bristol	£3,500
Wood	8,330
Shardlow	7,300
Griffiths	7,332
Byard	6,880
Woodward, Gloucester	6,800
Todhunter, Godalming	6,538
Jovett, Brighouse	6,348
King	6,043
Beaven, Gloucester	£6,084
Mason, Cardiff	5,382
Meredith	5,320
Riley	5,704
Reading	5,681
Powell	5,386
Scull	5,189
Perkins	5,000
Dixon & Fish, Kettering	3,647

[Engineer's approximate estimate, £5,474.]

MANFIELD.—For alterations and additions to public baths, for the Corporation. Mr. R. F. Vallance, borough surveyor:—

Cahill & Leverton, Work-	£4,520
son	2,550
J. Greenwood	5,200
Vallance & Blythe	5,115
C. J. Percival	4,360
Twettridg & Moore	4,360
A. F. Houston	4,300
S. B. Frisby	4,198

* Accepted.

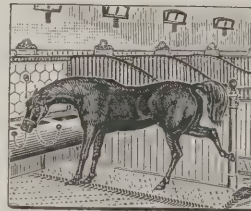
[Rest of Mansfield.]



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Early application should be made, as after the present stock is exhausted, it is unlikely that further copies will be obtainable.

“SPECIFICATION” No. 6 (1903) is now in course of preparation, and Subscriptions should be sent in without delay.

SPECIAL NOTICE TO ADVERTISERS.

The most important point to be considered by an Advertiser—next to the selection of the medium—is the question of the position his announcement occupies.

In “SPECIFICATION” the Advertisements are arranged to face the particular matter to which they relate; but the demand for these “facing matter” positions has been so great (more than 100 pages have already been booked) that there are very few left, and these will be allotted in strict order of application.

Immediate notice should therefore be given to the Advertisement Manager of space required.

A BROCHURE giving full particulars of the 1903 Issue will be sent post free on application.

COMING EVENTS.

Wednesday, July 9.
SOCIETY OF ARTS.—Annual General Meeting at 4 p.m.
INSTITUTE OF SANITARY ENGINEERS.—Meetings of the General Purposes and Finance Committee at 4 p.m., Election Committee at 5.15 p.m., and Special Council Meeting at 7 p.m.

Thursday, July 10.
INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—Annual General Meeting at Bristol (3 days). First Day.

Friday, July 11.
NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Excursion Meeting at Bishop Auckland to inspect the Electrical Pumping and Coal-cutting Plant at South Durham Colliery.

Saturday, July 12.
NORTHERN ARCHITECTURAL ASSOCIATION.—Students Sketching Club Excursion to Chester-le-Street and Lumley Castles.
LEEDS AND YORKSHIRE ARCHITECTURAL ASSOCIATION.—Visit to the Central Library, Hull, and Beverley.
ARCHITECTURAL ASSOCIATION.—Third Summer Visit to view some specimens of the work of Mr. O. F. A. Voysey at New Place, Haslemere, by permission of Mr. A. M. S. Methuen, and also to Stotley Place, by permission of Messrs. Read & Macdonald.

Saturday, July 13.
ARCHITECTURAL ASSOCIATION.—Members begin to assemble at the "Red Lion" Hotel, Banbury, the headquarters, for the Summer Excursion.—Camera and Cycling Club visit Brewers' Hall, E.C., at 3 p.m.
SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—A Morning Meeting and Summer Excursion.

		£	s.	d.	£	s.	d.
Copperas	per ton	2	0	0	—	—	—
Lard Oil	per cwt.	2	13	0	2	14	0
Lead, white, ground, carbonate do.	do.	1	4	10	—	—	—
Do. red	do	1	0	4	—	—	—
Linseed Oil, barrels	do	1	10	4	—	—	—
Petroleum, American	per gal.	0	0	6	0	0	6
Do. Russian	do.	0	0	5	0	0	5
Pitch	per barrel	0	7	0	—	—	—
Shellac, orange	per cwt.	5	8	0	—	—	—
Soda, crystals	per ton	3	2	8	3	5	0
Tallow, Home Melt	per cwt.	1	11	0	1	12	6
Tar, Stockholm	per barrel	1	2	6	—	—	—
Turpentine	per cwt.	1	14	3	—	—	—

METALS							
Copper, sheet, strong	per ton	69	0	0	—	—	—
Iron, Staffs, bar	do.	6	10	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	10	0	12	0	0
Lead, pig, Soft Foreign	do	11	6	3	—	—	—
Do. do. English common brands	do.	11	10	0	11	12	6
Do. sheet, English 3lb per sq. ft. and upwards	do.	13	5	0	—	—	—
Do. pipe	do.	13	15	0	—	—	—
Nails, cut clasp, 3in. to 6in.	do.	9	5	0	—	—	—
Do. floor brads	do.	9	0	0	—	—	—
Steel, Staffs, Girders and Angles	do.	5	15	0	6	5	0
Do. do. Mild bars	do.	6	10	0	7	0	0
Tin, Foreign	do.	126	10	0	127	0	0
Do. English ingots	do.	127	0	0	127	10	0
Zinc, sheets, Silesian	do.	22	7	6	—	—	—
Do. do. Vieille Montaigne	do.	24	10	0	—	—	—
Do. Spelter	do.	18	15	0	19	0	0

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Fir, Dantzic and Memel	per load	3	0	0	4	10	0
Pine, Quebec, Yellow	per load	4	7	6	5	0	0
Do. Pitch	do.	2	14	0	8	12	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	8	—	—	—	—
Deals, Archangel 2nd & 1st per P. Std.	16	15	0	24	15	0	—
Do. do. 4th & 3rd	do.	8	10	0	15	15	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	12	10	0
Deal, Petersburg 1st Yellow	do.	16	5	0	—	—	—
Do. do. 2nd	do.	9	0	0	12	10	0
Do. do. White	do.	7	5	0	12	10	0
Do. Swedish	do.	8	15	0	12	10	0
Do. White Sea	do.	13	5	0	17	5	0
Do. Quebec Pine, 1st	do.	11	10	0	24	10	0
Do. do. 2nd	do.	22	5	0	—	—	—
Do. do. 3rd & 4th	do.	9	10	0	—	—	—
Do. Canadian Spruce, 1st	do.	7	10	0	12	10	0
Do. do. 3rd & 2nd	do.	7	0	0	9	10	0
Do. New Brunswick	do.	7	5	0	8	0	0

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Beans	per qr.	1	15	0	2	0	0
Clover, best	per load	4	15	0	5	10	0
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Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	10	0	2	4	0

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Castor Oil, French	per cwt.	1	5	1	1	6	0
Colza Oil, English	do.	1	6	6	—	—	—

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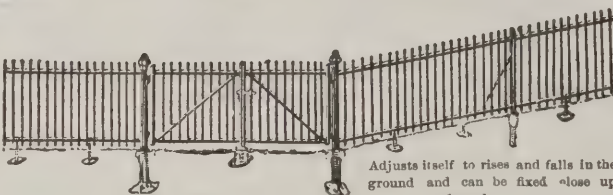
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It was a melancholy fate that
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nation Bazaar last Thursday
should have been preceded by

a disaster in which one lady was killed and many others injured. A rope with five large flags on it had been stretched from the Langham Hotel to the stone balustrade over the porch of All Souls' Church. There was a high wind blowing at the time and a gust of special force caused a great piece of the coping to be torn off and flung on the crowd below, with the results already stated. All Souls' Church is a building of the early nineteenth century with its western end formed into a semicircular portico having Corinthian columns. Above is the balustrade in question. It consists of a coping about 18in. wide supported by turned stone balusters spaced at intervals of about 2ft., of which balusters there are seven in each section, with a half-baluster against the face of the piers that divide the sections. From this level the spire rises, a colonnade encircling its lower part. We have made an inspection of the balustrade and find it to be in a dangerous condition. It is built of Anston stone, a calcareous sandstone which has perished by the action of the acids in the London atmosphere. The binding quality of the stone was originally in its calcareous cement, but this now seems so weakened that the stone can be broken between the fingers. About five years ago the vestry spent £800 in repairing the spire and exterior of All Souls' Church, and at that time a Frenchman's cement was used to patch up the balustrade. This cement is now loose and can be torn off with ease. The balustrade being in this condition, and the balusters themselves being simply laid flat on their bed and not properly dovetailed in position, it is not surprising that when a rope with five large flags was made fast to it the whole should collapse. This is not the first time that the rope has been used for flags; it has been attached by the Langham Hotel authorities four times during recent years, the other end being made fast to a small balustrade on their own building: but the stonework becoming yearly in a weaker condition succumbed to the strain on this last occasion. At the hearing of the inquest on Saturday last the man who put up the flags said the rope was a wire one, which thus disposes of the suggestion that the rain had contracted it and so increased the

strain on the coping around which it was tied. But the present condition of the stonework is apparent, and the rope should never have been tied to it: other parts of the balustrade are in a much worse state even than that which fell. This disaster emphasises the necessity for the regular inspection of balustrades, cornices balconies and other parts of buildings, and shows moreover how imperative it is that the stonework should be properly doweled together.

St. Mark's. The detached campanile of
Campanile. St. Mark's Cathedral, Venice,
98 metres high, fell down on
the piazza on Monday morning last and is now
a heap of ruins. The cathedral and the Doge's

be a good thing to have a Select Committee to enquire into the unfinished decorative condition of some of the rooms in the great parliamentary building, but, like his last year's proposal for the reappointment of the old Royal Commission on Fine Arts of 1842, this was negatived. Last year Lord Salisbury himself was able to groan out a pessimistic and unconvincing reply; this year the Marquis of Lansdowne does it for him. He doubtless thinks it would be very pleasant to have the rooms decorated throughout, but then there is the bill to pay for "any little extravagancies that might result from the enquiry of the noble Lord's Committee." It is all there in a nutshell. Few members in either House really care a rap for art or architecture, and, consequently



"HILLSIDE," GLEDHROW, LEEDS: THE ENTRANCE CORRIDOR.
BEDFORD AND KITSON, ARCHITECTS.

Palace are happily quite safe. Only a corner of the Royal Palace is damaged. This information reaches us at the moment of going to press. In our next issue we shall give an illustration and full particulars of the campanile, which was built in the tenth century, the belfry having been designed by Bartolommeo Buon and added in 1510.

Artless Lords. FITZSTEPHEN speaks of an
"incomparable structure fur-
nished with a breastwork and a bastion," but
the "Palace of Westminster" which the Lords
discussed last week is no other than the Houses
of Parliament. Lord Stanmore thought it would

whilst there is nobody to stir their spirits in regard to these matters we can never hope to get much out of them. What more characteristic of the way in which the official mind regards these things than the Marquis of Lansdowne's remark—he understood from his colleague in charge of the Works Department that he was ready to make arrangements under which a moderate sum would be yearly appropriated to the decorative work. As Lord Rosebery pointed out last year, the old Commission spent £4,000 a year. Lord Salisbury reduced it first by one-half and then by a quarter, and even suggested £1,000 as a suitable sum. Why not employ a few house-painters? It would be cheaper still.

FIRE SERVICE IN FACTORIES, WORKS, &C.

A PUBLICATION (No. 8) on this subject by Mr. Harold Sumner has just been issued by the British Fire Prevention Committee, 1, Waterloo Place, Pall Mall, S.W., price 1s. It is assumed, for the purposes of the paper, that the factory or works under consideration covers several acres; that the water-supply is ample, but *not* from a public supply; and that there is no fire-brigade within reasonable distance. Mr. Sumner advises the provision of a stationary duplex pump housed in a building of its own, to be tested at regular intervals, and to work efficiently with a low as well as a high steam-pressure (this is essential, as the pressure is often low at night-time and during any stoppage of the works). The pump should be directly connected with the principal system of fire mains, which should be large and at least 2ft. 6in. below the surface. It is advisable, in addition, that the mains should be connected with an overhead tank on the roof holding at least 6,000 gals. or to a public supply main. Hydrants and valves should be of gun-metal, and all underground valves should be placed in cement built brick chambers. Supplementary to the steam pump, buckets, hand pumps and chemical "extinguishers" should be provided, but "hand grenades," Mr. Sumner observes, are generally useless unless in the hands of specially-trained men. A manual or steam fire-engine may also be provided if considered necessary. A brigade should be formed of men in the works, and "it is perhaps more satisfactory that the men be remunerated for drills than that their services be voluntary."

The fire appliances should be inspected weekly, and a proper watching service or patrolling of the works organized. Wooden partitions should be avoided as far as possible and fire resisting doors placed at all openings in party walls or other dangerous positions. "Iron doors are not to be recommended; they are heavy and unreliable, owing to their tendency to warp or buckle when exposed to great heat. Doors made of two or three thicknesses of timber, covered with lap-jointed sheets of tinned steel, are in every way preferable to the solid iron door. 'Fireproof' shutters can be usefully employed in certain cases, but care must be taken that the entire window-framing is fire-resisting." At the end of the publication some particulars are given of the fire-protective arrangements made at the works of the Standish Co., Ltd., of Worthington, near Wigan.

"Lincombe," Headingley, Leeds.—This house by Messrs. Bedford & Kitson is constructed of common brick rough-casted, with stone window mullions, square in section. There is a hall 12ft. sq. from which the living rooms open.

"Hillside," Gledhow, Leeds.—This house was altered and almost reconstructed last year according to the designs of Messrs. Bedford & Kitson, of Leeds. The entrance corridor (illustrated on the preceding page) has a black and white marble pavement. The walls are panelled in wood, painted white, and the ceiling has quadripartite vaulting executed in fibrous plaster. The gallery measures 40ft. by 15ft., and has an oak floor, panelled walls and enriched plaster ceiling.



"HILLSIDE," GLEDHOW, LEEDS: A CORNER OF THE GALLERY.
BEDFORD AND KITSON, ARCHITECTS.

TRURO CATHEDRAL.

The Progress of the Nave.

SOME interesting information concerning the progress of the building of the nave of Truro Cathedral is given in the "Diocesan Magazine." Since it was decided, after considerable discussion in committee, that the work of vaulting the nave of the cathedral should be continued without removing the fractured bases, considerable progress has been made. "Happily, the bases in which these fractures were discovered more than a year ago exhibit no sign of further movement, and it may therefore be hoped that, as they are supporting more weight than in July, 1901, they have found their bearings."

"The space over which the groined vault extends is very considerable; the work demands alike deliberation and care, and cannot be hurried. The vault of one bay and of the western towers is complete, and the diagonals and cross-springers of the vault of a second bay are in process of construction. From the west front the scaffolding is being removed by degrees. The glazing of the great rose-window, of the lancet windows beneath it, and of the upper tiers of lancets in the western towers is completed."

"The vaulting of the side aisles will follow the completion of that in the nave. The south-west porch abutting on the south side of the high cross is now almost finished. As the main body of workmen are engaged on the nave, a few only are just at present at work on the central tower. Before long the tower will be crowned with its parapet, and then the work of erecting the spire will be commenced, but the progress of both tower and spire cannot be hurried."

"A scheme for the statuary of the west front and south-west porch is being worked out by a sub committee (aided by Canon A. J. Mason and Canon H. S. Holland) appointed for the purpose, but until the report has been presented to the general committee it will not be published. There are altogether eighty-eight niches and panels to be filled with figures and other sculptures, and eleven niches more are still vacant in the buttresses either of the baptistery or the Phillpotts' porch. Meantime persons who may be desirous of presenting figures may learn some particulars on application to Mr. E. Price, clerk of the works; Precentor Donaldson, or Chancellor Worledge. Doubtless many years will elapse before all these niches and panels are filled, but it would be a gain if some of the principal positions could be occupied shortly. Three or four panels or figures have been already promised. Four of the lancet windows of the nave will be filled with stained glass, already given, before the new portion of the building is dedicated. It is at present premature to say at what date the nave will be opened, but probably the event will take place in the earlier part of the summer of next year (1903). All the work done is of a satisfactory and solid nature, the designs being entirely in accordance with those made by the late Mr. J. L. Pearson, R.A., carried out under the able direction of Mr. F. L. Pearson, his son."

An American Criticism.

With regard to Sir Thomas Drew's recently-published report on the cracked bases of some of the piers, the "American Architect" says: "The remedy suggested by Sir Thomas Drew for the trouble looks, at first sight, rather doubtful. According to the diagram given in the report, he proposes to shore up the injured piers; remove the broken base-stones, replacing them with a single stone instead of two thin ones; lower the rubble foundation, apparently by taking off the upper course, and replace this course by a layer of concrete of the same thickness. If this layer of concrete were stiffened with a sufficient number of iron beams, as would be done in this country, the remedy would probably be effectual; but as the concrete course is shown projecting to a distance considerably more than twice its height beyond the base of the pier, it would, without the embedded gridiron of beams, probably soon break off under the pier at a little distance inside the face of the plinth, throwing the load, as before, on the middle portion of the foundation, and allowing the rubble blocks on the outside to roll as badly as ever."



"LINCOMBE," HEADINGLEY, LEEDS: FROM THE SOUTH.

BEDFORD AND KITSON, ARCHITECTS.

Views & Reviews.

Robert and James Adam.

This is a very fine reprint of that series of engravings published a century and a quarter ago by Robert Adam and his brother James. The familiar accusation of dead copyism has been made against many classic architects of note, but it is certainly least applicable to the work of Robert Adam, which, however much dependent on Greek and Roman models, was so infused with freshness that it has always been regarded as eminent, scholarly and stately. It will be remembered how this architect, after spending three years in Italy examining the mighty remains of the Romans, journeyed in company with a French architect and some experienced draughtsmen to Spalatro, there to measure the ruins of Diocletian's palace; the publication of the results following in 1764. About ten years later came the series of engravings of his own and his brother's designs now given in this reprint.

The cost of the publication, it will be noticed, is ten guineas, but this is not excessive when it is seen how sumptuous a production it is and how rare the originals are—with regard to the latter we know of only two complete copies, namely, those at the British Museum and the Art Library at South Kensington (the Royal Institute of British Architects does not possess the third volume). The originals, as stated above, were engravings. The reprint is done by photography, and the results are, at least from the architect's point of view, equal to them.

The whole work consists of three volumes (grand imperial folio), divided into ten parts, supplemented by the original introductory and descriptive text in French and English. Each part costs one guinea. The edition has been limited to 500 copies in order to sustain the market value of the work, and each copy is numbered, bears the subscriber's name, and will be entered at the Cercle de la Librairie of Paris. The ten parts have now been issued, so that the work is complete; it is nearly all subscribed.

The architecture of the brothers Adam has been well discussed for more than a hundred years, and there is no necessity therefore, in noticing this production, to repeat what has already been said over and over again; suffice it to say that, whether it is admired or not, this

architecture certainly plays an important part in our own history, and must therefore be taken account of, and there is no better record for the architect to possess than this series of large reproductions.

We think the following extracts taken from the original preface of the first volume will be read (or re-read) with interest at the present time:—"The massive entablature, the ponderous compartment ceiling, the tabernacle frame, almost the only species of ornament formerly known, in this country, are now universally exploded, and in their place, we have adopted a beautiful variety of light mouldings, gracefully formed, delicately enriched and arranged with propriety and skill. We have introduced a great diversity of ceilings, friezes, and decorated pilasters, and have added grace and beauty to the whole, by a mixture of grotesque stucco, and painted ornaments, together with the flowing rainceau,* with its fanciful figures and winding foliage. . . . The rules and orders of architecture are so generally known, and may be found in so many books, that it would be tedious, and even absurd, to treat of them in this work. We have, however, to observe that among architects destitute of genius and incapable of venturing into the great line of their art, the attention paid to those rules and proportions is frequently minute and frivolous. The great masters of antiquity were not so rigidly scrupulous, they varied the proportions as the general spirit of their composition required, clearly perceiving, that however necessary these rules may be to form the taste and correct the licentiousness of the scholar, they often cramp the genius and circumscribe the ideas of the master."

Among these reprints are many of the most notable designs of Robert and James Adam. In the first parts are the ducal seats at Sion, Kenwood and Luton Park, with their numerous details, followed by such well-known designs as those for the Admiralty, the Society of Arts and other famous houses in London, the Register House at Edinburgh, together with scores of designs for the decoration and fittings of these buildings.

"The Works in Architecture of Robert and James Adam," reprinted. London: E. Thezard Fils, 36, Great Titchfield Street, W. In ten parts, price £10 10s. nett.

* Used to express the winding and twisting of the stalk or stem of the acanthus plant in combination with figures, animals, birds, fruits and flowers.

Dampness and Dry Rot.

The Germans have always been praised for their thoroughness in the treatment of scientific subjects, and this book affords but another instance of this characteristic. The prevention of dampness in buildings is a very important subject to the architect and the civil engineer, but we find the available information to be very scarce and often inaccurate or useless. It has remained for Herr Adolf Wilhelm Keim to collect what information was available and to make a special study of the subject. The result of his investigations is embodied in this book, which is a very able translation by Mr. M. J. Salter, F.I.C., F.C.S., of the second German edition. The subject, although, as we have said, treated from a scientific standpoint, is easily read and comprehensible to those with little or no scientific training or knowledge. It has been remarked "that the importance of having dwellings free from mouldiness and fungoid growths has hitherto been far too little appreciated from a hygienic point of view. Very frequently this consideration is lost sight of altogether, and many a dwelling in which children are brought up is so conditioned that any owner would hesitate to use it as a stable. In the latter there would at least be more ventilation. And this notwithstanding that the conditions of the dwelling have the greatest possible influence on the health and the bodily and intellectual development of a people, a social class, a family, and an individual." Damp houses are also cold, and the injurious effect of this on health is too well known to need reiteration. The book commences with a chapter on the causes, and is followed by one on precautionary measures to be taken during building against dampness and efflorescence, which latter, if present, will absorb moisture and cause dampness and decay. Then follows what is perhaps the most useful and important part of the work—methods for remedying dampness and efflorescence in the walls of old buildings, and their artificial drying. Part II. of the book is devoted to a discussion of the causes and origin of dry rot and its effect on health and buildings, and methods of preventing it to be adopted during construction, and remedies for it. The illustrations are well and clearly reproduced, several plates being in colours.

It is evident that prevention of dampness and dry rot can now be entirely overcome by



methods described in the book, but the question of expense is a material factor, and though it is quite right to include all possible methods, however expensive they may be, we are inclined to think that many of the methods are likely to be seldom adopted. The methods of preventing dampness and dry rot occurring in new buildings, by taking special precautions during construction, are, however, all quite possible of adoption on the score of economy, but the suggestion to use fire-boxes of special form with air blast against walls to dry them does not strike us as particularly practical, for not only would it be somewhat expensive to adopt, but might cause damage to plaster by the quick drying absorbing the water and causing flaking. It is generally better to take the usual course of allowing the buildings to remain empty for some months to dry, and then at the end of that period to place braziers in the house with coke fires for a short time to air the rooms. At the same time, these specially-shaped fire-boxes would be of considerable service in drying old damp basements before rendering with an asphalt vertical damp-course.

The book, however, is on the whole very practical, and should be studied by everyone designing premises used as dwellings.

"The Prevention of Dampness in Buildings, with remarks on the causes, nature and effects of saline efflorescences and dry rot." By Adolf Wilhelm Keim, technical chemist. Translated from the German of the Second (Revised) Edition by M. J. Salter, F.I.C., F.C.S., member of the German Chemical Society of Berlin. London: Scott, Greenwood & Co., 19, Ludgate Hill, E.C. Price 5s. nett.

A New Boat-house at Bristol has been erected for the Redcliff Rowing Club. The house is two-storeyed, and the foundation is piled, the lower storey being the boat-house, the platform from which runs to the water-level. Accommodation is provided for nearly twenty boats. The dimensions of the house are 54ft. by 17ft. wide. On the upper storey there are three rooms, the central one being a commodious dressing-room for men, 27ft. long by 17ft. 6in. wide, surrounded with lockers, whilst on the Bristol Bridge end there is situated a ladies' room divided off with a movable partition, and in which are lockers, so that when it is not a ladies' day there will be sixty lockers at the command of rowing men. On the reverse side to Bristol Bridge there is another lavatory for the men, with commodious shower-baths and other conveniences. The plumbing has been done by Messrs. F. & W. Bracher, of Redcliff Street, Bristol. Mr. James Hart, Corn Street, was the architect, and the builders were Messrs. T. Lovell & Son, Park Row, Bristol.

Correspondence.

Shops and Flats at South Kensington.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, E.C.

SIR,—I notice in your issue for July 2nd, on p. 308, a paragraph relating to certain blocks of shops and flats now in course of erection at the corner of Old Brompton Road and Redcliffe Gardens. I desire to state that, although I have designed the plans of some of these blocks and am professionally interested in the estate on behalf of certain clients, I am not responsible for the elevations, which have been designed by the freeholder's surveyors.—Yours truly

PAUL HOFFMANN.

A NEW THEATRE AT HULL.

A NEW theatre, to be called the Alexandra, is now in course of erection at Hull. The house is to hold about 3,000 persons. The site is bounded on three sides by streets, the frontage being in George Street, the east by Bourne Street and the north by Mason Street, thus giving opportunities for exits far in advance of the County Council requirements. The theatre will be built in Renaissance style, carried out in 2½in. bright red bricks and light terra-cotta dressings. A verandah, 15ft. above the pavement, will be over the principal entrance. An electric tower will be situated at the corner of George Street and Bourne Street, surmounted by a powerful searchlight. This light will be seen for many miles round, and can be used for flashing important news, such as the result of an election, to the whole country-side. There will be eleven wide entrances and exits. The theatre will be lighted throughout by electricity from the Corporation mains, with a special system of wiring, so that in the case of a local failure only one-half of the lights will be extinguished, but in the event of the Corporation supply being at fault gas will be always lighted as a stand-by, so that neither the auditorium, stage nor exits can possibly be in darkness. The heating of the building will be on the low-pressure hot-water system, and an innovation will be the heating of the stage. This important item is overlooked even in many of the most modern houses, and is the frequent cause of cold draughts. The system of hydrants will be approved by the city fire authorities, and the whole of the front and back parts of the house, also all staircases and rooms used by the public,

will be fireproof. The auditorium is to be constructed of iron and steel. The ventilation has been specially studied; Tobin tube inlets and Boyle's air-pumps, with a sunlight burner at the mouth of the large central shaft, being used. Over the gallery, the highest point in the building, will be a large sliding glass and iron roof. This will be worked from the stage. Seating accommodation will be arranged for 2,200 people, with additional provision for standing room for 800, made up as follows:—Seating, gallery, 620, standing, 200; seating, family circle, 280, standing, 100; seating, dress-circle, 172; orchestra stalls, 56; pit stalls, 576; pit, 496; standing, pit and pit stalls, 500. The size of the auditorium will allow this number without any inconvenient crowding. The principal entrance from George Street to the circle and family circle (one tier) is 15ft. 6in. wide, leading at a lower circle level into a spacious lounge and foyer, and thence to right and left over the pit. Under the family circle wide fireproof corridors will lead to the dress-circle, private boxes and orchestra stalls. The corridor to the family circle leads to a staircase with wrought-iron railing, and then to a landing from which a glimpse of the interior of the auditorium can be obtained. There are also commodious retiring-rooms and a promenade with a balcony overlooking George Street. A subway has been constructed beneath the stall and pit floor, with an entrance from George Street, leading to the sides of the stalls. All the ticket issuing for every part of the house is under the control of the manager, all money being taken—when early doors are closed—practically in one office, with five cash windows for the different entrances. Pass-doors are also provided. Plastic decoration will be employed inside, with gold coloured draperies, and a large number of dressing-rooms of ample dimensions adjoin the stage. Mr. Thomas Guest, of Birmingham, is the architect.

"STEEPHILL," JERSEY.

THIS house by Mr. Ernest Newton is built on the high ground looking down on St. Heliers. It occupies the site of an old house, and so enjoys the advantage of an old garden. The building is "rough-cast," with hand-made red tiles for the roof. Internally there is a good deal of panelling, all made in Jersey. The ceilings of the hall, library and drawing-room were modelled by Mr. G. P. Bankart. The general builder was Mr. Crill, of Jersey, and Mr. R. Lloyd, architect, of Jersey, superintended the work throughout.



"STEEPHILL," JERSEY : THE HALL. ERNEST NEWTON, ARCHITECT.

[Photo : Albert Smith, Jersey.]

THE POSITION OF THE CONTINUOUS FRIEZE ON GREEK TEMPLES.

BY FREDERICK S. SALISBURY, B.A.

IN the decoration of a piece of pottery the vase-painter has two main methods open to him. He can adorn it with bands of figures running round it, or can paint a complete and simple design in a panel on each side. Before the Persian wars, and in proportion as their source is nearer to Oriental influence, the bands of figures predominate; while the panel is the favourite method with Greek vase-painters of the later red-figured period. Greek painting shows the same change from extended frescoes, such as those of Polygnotos and his contemporaries Micon and Panainos, to the easel-paintings of Zeuxis and Apelles.

There is the same contrast of style between the Doric frieze of triglyphs and metopes and the continuous band of the Ionic frieze; but in consequence of the marked geographical separation, which I shall point out, between the two orders of architecture, we do not find as in the other arts above-mentioned the same striking chronological sequence. Indeed, as in many features a decaying art reverts to its archaic character, so Greek art in the period of its decline is distinguished by a striving after effect and a love of display which were in the time of its infancy the result of Oriental influence. Hence the Ionic frieze grows in favour on the mainland, and tends to supplant the Doric, with the curious result of an apparent inversion of the sequence noticed in other branches of art.

One of the earliest continuous friezes known, which occupied the regular position on the building it decorated, was found in excavations at Delphi on the probable site of the treasury of the Siphnians. It dates from the sixth century B.C., and represents the contest over the body of Sarpedon. But we are not entitled, in setting up geographical divisions in art, to assume that a monument found at Delphi or Olympia belongs artistically to the mainland of Greece. These great religious centres were pan-Hellenic; they received offerings from Greek communities all over the Mediterranean basin, and the most important cities had built within the sacred precincts a special treasury in which their gifts were from time to time deposited. The Siphnians, to whose treasury the present frieze belongs, inhabited one of the Ionian islands of the Cyclades; and the subject of the frieze is even exceptionally Asiatic in character, for the contest is over the corpse of a Lycian hero, an ally of the Trojans. The Asiatic subject from a city of Continental Greece may be contrasted with the Peloponnesian subject (the myth of Heracles) of the continuous frieze on a temple at Assos in the Troad, of which more anon.

But it is from exceptional uses, and an endeavour to account for them, that we shall learn the most. A single deviation from the general rule will teach us more than ninety-nine examples that observe it. Not a little remarkable is the fact that a continuous band of low-relief, scarcely (if at all) later than the Siphnian Treasury, was found in Asia Minor belonging to a Doric temple, and occupying a position upon it for which we have no other parallel. There are in the Louvre seventeen slabs from the Doric temple at Assos in the Troad, chiefly representing subjects from the myth of Heracles, and eight more have since been discovered by American excavators, of which seven are at Constantinople and one at Boston. The temple had a frieze of triglyphs and metopes, as others of the Doric Order, and the continuous band of relief was placed just beneath along the architrave. The position is remarkable, but it is also instructive. M. Collignon endeavours to explain it by suggesting that the relief corresponds to bands of metal applied to old temples in wood, and he compares reliefs which ornamented the cornice of the earlier temple of Artemis at Ephesus. I do not dispute it, but the same remark seems equally applicable to bas-relief in any position on a building, and does not explain the abnormal use in the present case.

The true solution probably is that the Asiatic sculptors of this Doric temple have treated their

subject—a purely Hellenic one—in an Oriental spirit. The temple at Ephesus, with the sculptured bases and lower drums of its columns and its figured cornice, breathes the Eastern love of ornament. An early Cyprian vase is covered from foot to rim with bands of animals, and even the spaces around the figures are filled in with rosettes. No space must be left unoccupied. And the same dislike of a plain surface is observable on the earlier and more Orientalised temples. The Ionic Order will bear a good deal of ornament, and is therefore the favourite, as it is also largely the creation of the Ionian coast of Asia Minor. But to them the genius of the Doric temple, in which even the sculpture properly preserves a plainness almost equal to that of the architecture it decorates, was entirely foreign. The Doric temple of Assos is a denizen in a strange land; and naturally its decorators have not realised or not appreciated the real character of their subject, and have ornamented it in a half-Ionian manner.

In fact, the frieze of triglyphs and metopes was essentially a creation of the Peloponnesus, where composition in sculpture was always of the simplest kind, and where the plastic art found its favourite expression in the single, and by preference the undraped, statue. Even at Athens it did not hold the premier place. The vivacious and talented Athenian was of the same stock as the Ionian of the Asiatic littoral. He loved elegance, and he had a genius for composition—the genius which makes literature, and in that he was supreme. Athens received the poems of Homer with open arms. They were first collected and committed to writing under the direction of Peisistratos in the sixth century B.C. Neither Ionians nor Athenians any longer wrote heroics, but the one people produced Herodotus, the historian of the Persian wars, and the other Thucydides, who described the great struggle between Athens and Sparta for the supremacy in Hellas. And histories are epics in prose. And, following Homer, an equal welcome greeted the Ionic frieze—the epic in stone.

It is not surprising, therefore, that in the Panathenaic frieze of the Parthenon, Pheidias applies this form of decoration to a Doric temple. On this noble edifice, the crowning monument of a great artistic scheme, he longed to portray the splendid procession of which once in four years it was the closing scene. He could break up a battle between Lapiths and Centaurs into a series of single combats, but for a procession nothing but a continuous frieze would serve. But an important point is to be noticed. Pheidias did not, as was done in the temple at Assos, place it on the exterior, where it would form as it were an architectural feature. He fully realised that to do so would be running contrary to the spirit of the order he had employed. Accordingly he put the frieze under the colonnade round the top of the cella wall, where its effect would be purely ornamental.

The use of the continuous frieze in this manner in Doric temples was recognised at Athens as perfectly legitimate. It occurs again in the temple of Theseus which was finished rather later than the Parthenon. I mention it here because of a peculiar feature. The wall of the cella was not surrounded entirely by a frieze, but there were two short friezes of unequal length—one on the entablature over the pronaos, the other on that over the opisthodomos. At the west it stretched only between the antæ. But at the east it was continued along the entablature, which was prolonged to the outer colonnade. Along the sides the cella wall was undecorated. The outer frieze of triglyphs and metopes shows even greater irregularity. Only eighteen of the metopes are sculptured, and all of these are arranged at the eastern end—ten over the portico and four just beyond the angle on each side. What was the reason of this want of symmetry in the work of a school to which the sense of balance was an almost imperative monitor? It may have been that the outbreak of the Peloponnesian war diverted the necessary finances to military purposes. Or, since the metopes deal with the exploits of Theseus and Heracles, the paucity of subjects in the versions of their stories as then received at Athens may have had something to do with it. A definite conclusion appears impossible.

The temple of Apollo at Phigaleia in Arcadia shows us yet another application of the continuous frieze in a Doric temple. And it is a step in a series of steps leading to a definite end. The architect, and perhaps the sculptor, was Ictinus, the same man who had designed the Parthenon, and with him probably had come sculptors from the school of Phidias. With the examples of continuous friezes at the Parthenon and Theseum before us, we are not surprised to find one also at Phigaleia. But the position is novel. The frieze was arranged round the hypæthral opening by which the cella was lighted. Here, then, for the first time is a continuous frieze employed for interior decoration. From this position there is but a short step to its use in the interior of a room, and it has been brought to this point by its essentially decorative character. Metope-sculpture could never have come here. Its relief would have been too high and its effect too massive and heavy. But a spacious room would easily bear a band of low-relief.

If it were not a scarcely fair criterion we might add the internal frieze of the Heron at Trysa in Lycia. But enough has been said to emphasise the decorative character of continuous bas-relief as contrasted with the architectural effect of the Doric frieze with its salient triglyphs and the high relief of its sculptured metopes. The continuous frieze is capable of a very wide application—from the largest building to the smallest monument. It occurs on the Sidon sarcophagi and on the choragic monument of Lysicrates. Not so the Doric frieze. It is a part, as it were, of the Doric temple, and there it stays.

And not less marked is the Oriental character of the continuous bas-relief. The three friezes of the Nereid monument sufficiently indicate how grateful it is to Asiatic taste. The friezes of the Xanthos monument are separated by a long line of ancestry from their Oriental prototypes. But here, where once again in this corner of Asia Minor two hostile and yet kindred arts meet face to face, they are seen to be in much the same, and yet how different! This lesson also, among many, the youthful West has learned from the immemorial East, and in the moment of learning has corrected and criticised its teacher. This tradition also a living Art has borrowed from the dead stock-in-trade of Artifice, and borrowing, has breathed into it the breath of life.

[An article on "The Assyrian Element in Greek Decorative Art" appeared in THE BUILDERS' JOURNAL for June 12th, 1901, and another on "The Frieze of Triglyphs and Metopes on Greek Buildings" in the issue for May 7th, 1902.]

Law Cases.

The Thickness of Walls : Important Statement.—At the South-Western Police Court a decision under the London Building Act respecting the proper thickness of walls was recently given in a considered judgment by Mr. Rose. Mr. H. Blackburn, a builder, of St. Anne's Gate, S.W., proposed to erect three shops in Norwood, and the district surveyor (Mr. Percy Hunter) objected to the plans on the ground that the separation walls which divided the shop proper from the dwelling-rooms above had a thickness of only 4½ in. Mr. Blackburn thereupon appealed to the magistrate against the objection under section 150 of the Building Act. Mr. Hunter argued in support of his objection that the Act prescribed that all walls should be "properly bonded," and that they should be constructed of fire-resisting material; that bricks which were only 4½ in. thick could not be "properly bonded" because there was no room for cross-bonding, or headers and stretchers; and that a 4½ in. wall would buckle with heat very easily and so would, in the case of an outbreak of fire, render escape by the staircase almost impossible. The surveyor added that the clause in the Act relating to the thickness of walls was specially inserted as the result of a fatal fire at a shop close to the court in which, through defective lack of means of egress, some unfortunate girls lost their lives; and he urged that, in view of the recent terrible fire calamity in the City, this clause of the Act should be rigidly enforced. The appellant denied that

the Act prescribed any particular thickness. He knew of walls in the Strand which were less than 4in. thick, and were constructed of iron-plates and concrete. He argued further that, by the decision in the case of *Garrett v. Godson & Co.*, a building which comprised a shop and living-rooms for the occupier of the shop was exempted from the provisions of the clause relating to the construction of walls. The magistrate said he accepted the weighty opinion of the surveyor as to the actual construction of the walls, and he therefore held, as a fact, that a brick wall of only 4½in. in thickness could not be said to be a "properly bonded" wall. The point of law, however, which the appellant had raised was difficult and doubtful; and while he decided that the cited case of *Garrett v. Godson*—which referred to a beerhouse—did not apply in this case, he would be willing, if required, to state a case for the consideration of a superior court. He dismissed the appeal without costs.

Chesum were called on to do the work on the principle of short lengths, and therefore the lump sum price applicable to short length work was not applicable to the work which had actually been done. Owing to the extra depth of the foundations very difficult excavation and piling was rendered necessary. Mr. Roland Chessum, of the contracting firm, stated that the tender for the execution of the work amounted to £15,596. At one point witness explained they had to carry the foundations to an extra depth of between 10ft. and 11ft., and this was due entirely to water, which had to be pumped away. The whole of the soil below the contract depth was water-bearing. After detailing the extra work done, witness informed the arbitrator that he was instructed to do it by the clerk of works and by Messrs. Leeming & Leeming. The hearing was adjourned.

The Glasgow Technical College.—At Edinburgh last week, in the Court of Session, the division heard counsel in the petition by the Governors

EDMONTON MUNICIPAL BUILDINGS.

EDMONTON Public Baths and Town Hall are being extended. Mr. W. Gillbee Scott is the architect. The scheme is composed of four parts, the first and principal of which is the erection of the swimming baths. Then there is an extension of the Town Hall buildings, and a mortuary and post-mortem room is being built. With regard to the baths, there will be two of them—one covered and the other uncovered for use in the summer. The water area of each bath will be 90ft. by 30ft. They will be lined with marble mosaic, with similar footways all round. The covered bath will have an open iron roof with a continuous iron skylight the whole length. Each bath will have about fifty dressing boxes, and the covered bath will have a gallery all round it and raised seats and platforms for the purpose of swimming enter-



THE GENERAL POST-OFFICE, AMSTERDAM. C. H. PETERS, ARCHITECT.

Admiralty Buildings Arbitration.—The dispute between the contractors and the Office of Works with respect to certain "extras" incurred by contractors in the erection of the new Admiralty buildings was the subject of an arbitration enquiry opened on Thursday last before Mr. E. A. Gruning at the Surveyors' Institution. Mr. Cripps, in opening the case for the contractors, Messrs. Chessum & Sons, pointed out that the difficulties between the parties had reference to the shoring-up of the old Admiralty buildings and to questions of foundations and underpinning. The contract was a lump sum contract, and there were certain provisions for ascertaining what should be paid to the contractors if they incurred extra cost in carrying out the works. It was for the arbitrator to say what sum should thus be allowed. The shoring-up of the old buildings had to be carried to a greater depth than was shown on the contract plans, and, owing to the extra depth to which the foundations of the new buildings had to be taken the character of the timber from top to bottom had to be altogether altered. With regard to the underpinning of the old buildings, Messrs.

of the Glasgow and West of Scotland Technical College for authority to alter their scheme. They proposed to add to the Governors a representative of the Glasgow Institute of Architects. The Governors are about to erect a new Technical College, and £173,818 have been subscribed for the purpose. But the whole of it will not be paid for some time, and the Governors require to make payments to the contractors for the new buildings. Therefore they require to borrow money, and in a report upon the petition, Mr. J. E. Graham suggested that the sum to be borrowed or expended out of the capital of the endowments should not at any time exceed £30,000, to be repaid in ten years. The petition was granted.

The General Post-Office at Amsterdam is a characteristic example of modern Gothic in Holland by one of the leading architects.

At Thursby Church a number of improvements are about to be carried out. A stained-glass window and a lectern are to be added, and the organ is to be renovated. The church is also to be painted and decorated throughout.

tainments and exhibitions. Also in connection with the baths there will be a guest room for use by swimming clubs and entertainment committees. There will be twelve private baths. Inside the bath will be faced with red and white bricks. There is also a laundry for use with heating arrangements. As regards the Town Hall, the present staircase is being taken out, and the corridor continued through, terminating with a council-chamber measuring 50ft. by 30ft. and 20ft. high. The walls will be panelled and the ceiling circular. The room will also be used as a magistrates' court. Further, there will be an extension of the offices. The mortuary and post-mortem chamber will be put away at the back, where they will not be in evidence. The walls will be of white-glazed bricks. All the buildings will be faced with red bricks with stone dressings. The contractors are Messrs. Walter Lawrence & Sons, whose estimates for the various buildings are as follows:—Swimming baths, &c., £17,376; mortuary, post-mortem rooms, &c., £1,555; public offices, £2,735; boundaries, drainage, &c., £1,483—£28,149; errors allowed for in tender £96; total, £28,245.

Engineering Notes.

A New Engineering Industry at Dartmouth is about to be started. The well-known engineering firm of Messrs. S. S. Clay & Son, of Holloway, London, N., have taken a lease of twenty-one years in the property known as the Anchorage, and will shortly lay down plant for building motors and motor launches.

A New Railway Station at Carmarthen has been opened. The plans were prepared by Mr. J. C. Inglis, G.W.R. chief engineer; Mr. W. T. Dunsdon, Neath, being the divisional engineer; whilst the work was carried out by the contractors, Messrs. A. S. Morgan & Co., Newport, under the supervision of Mr. J. Lewis. There is a noticeable absence of pillars on the platform. Without exception the down platform is the longest freeboard one in South Wales, it being 210yds. in length, 100yds. of which are covered, and 20ft. wide. The approach over the old town bridge has been constructed at great expense owing to the necessity of protecting it from river-floods.

Mr. W. F. Faviell, M.I.C.E., who died last week at Tunbridge Wells, was the contractor who, in conjunction with his partner, Mr. Fowler, constructed the first railway in India. This was the line from Bombay up the Ghauts towards Poona, the first portion of which, to Tannar was opened in November, 1853. Ten years afterwards Mr. Faviell began making the line between Colombo and Kandy, which he finished four years later. His last contract was in South Africa in 1877, where he undertook to extend the Port Elizabeth railway, then only 67 miles long, into the interior in the direction of Cradock and of Graaf Reinet. Mr. Faviell came of a family of Yorkshire contractors, and gained his earlier experience in the West Riding and on the Essex part of the Great Eastern Railway.

A Large Engineering Scheme has been carried out at the Poplar Union Workhouse embracing an independent supply of water from deep wells, electric lighting and power supply, and a new hot-water system for the whole of the buildings. A full load test was made on July 2nd in the presence of the Board, when it was demonstrated that the plant supplied at one time the whole of the lighting, all the motors and the steam supply, and maintained the hot-water supply over the buildings. Further, at the time the plant was heavily loaded a trial of the fire arrangements was made with the result that water was thrown over the top of the highest building, a height of over 70ft. This new engineering scheme has been carried out under the advice of Mr. F. J. Warden-Stevens, consulting engineer, of Westminster.

Electric Lighting at the Crystal Palace.—The Electric Lighting Boards Company contributed to King Edward's Hospital Fund by undertaking the entire illumination of the Crystal Palace transept on the occasion of the great Empire Ball, and at the same time were able to do some record work so far as time was concerned. The installation comprised 2,200 lights, worked in the form of an enormous velarium over the centre of the transept, and outlining the galleries and royal box in festoons. The lights and festoons were covered with artificial flowers, and the number of connections required about two miles of cable, as the distance from the supply source was considerable. The whole of this work was executed in three days of ordinary working hours by three men and two boys under the supervision of the foreman, including the garland work and very difficult fixing at great heights. The Crystal Palace authorities retained the work for the American Festival on Saturday, and some well-known caterers propose taking over the whole of the installation.

The Incorporated Municipal Electrical Association held its seventh annual convention recently at the Institution of Mechanical Engineers, Mr. John H. Rider, president, in the chair. Mr. Rider, in his presidential address, said that the association was now representative of nearly 150 municipalities of the United Kingdom. In 1895 there were but five electrical street tramways, all, except Blackpool, owned by private companies. At present there were thirty-six owned by municipalities, and sixteen in course of con-

struction. With three exceptions the whole of those were worked by the overhead-wire system. That cost about £5,000 per mile of single track, including rails and paving, while surface-contact construction cost £10,500 and conduit construction £13,500. Owing to aesthetic considerations Washington, Paris, Berlin, and other places, adopted the conduit system in the centre of the town, with the overhead system outside, and several corporations had done the same thing, but it was really not worth while. It was true that the examples of overhead construction to be seen in several towns were anything but pretty, but that was the fault of the designer and not of the system. It was perfectly easy to erect an overhead line which would look well in any locality. Neat and even artistic work cost very little more than rough and unsightly work.

Masters and Men.

A Strike of Painters engaged in decorating the hospital at the Royal Naval College, Dartmouth, has occurred consequent on the refusal of the London firm who have secured the contract for painting having declined to accede to an application made by the workmen for an increase of wages. The standard rate of wages paid to painters in London is said to be 8½d. per hour. The painters at Dartmouth are receiving 6½d. Local men are naturally content to work in accordance with the standard rate of wages in the locality, and so have not joined their fellow workmen in their demand for an increase. Several of the men belong to Plymouth, Torquay and Newton, and it is these who have been asking for 7½d. an hour, in consideration of the extra expense involved in travelling and living away from their homes and the obligation the firm would be under to pay on the higher scale in the event of their having to import workmen from London. A short time ago, it is stated, the scaffolders were granted an increase of a halfpenny an hour, and just previously the carpenters had obtained an additional penny per hour. The native painters came out not long since, when their application for another halfpenny per hour was refused, but on that occasion the men returned.

Labour in the Colonies.—The Emigrants' Information Office state that this is the best season of the year for emigrants to go to Canada. Speaking generally, mechanics and labourers are well employed at this time both in towns and in country districts, but the labour market is unsettled in many parts owing to numerous strikes for higher wages and shorter hours, and the increasing cost of living. In British Columbia there is exceptional activity in the logging, lumbering and shingle industries. In New South Wales trade continues fairly busy both in building and construction work. The labouring classes generally are complaining of the increased cost of living owing to the new federal tariff. In Victoria there is no general demand for more labour. In South Australia and Tasmania the local labour is sufficient. In New Zealand the building trades have been busy throughout the Colony, except at Wellington and a few smaller places. Men in the engineering trades have been fairly well employed except at Wellington and Invercargill. In Cape Colony there is a good demand for mechanics, especially men in the building trades; but no one can land without first obtaining a permit from the Permit Office, 47 Victoria Street, London, S.W. In Natal there is a good demand at the present time for skilled artisans, more especially for carpenters and those in the building trades, but they cannot land without permits, which may be obtained at the Permit Office. The carpenters' strike is now settled, the men agreeing to accept an increase of 1s. a day (bringing their wages up to 15s. a day) instead of 2s. as at first demanded. None but refugees, Government employees, and persons engaged in a service of a public nature, will be permitted to move up into the Transvaal. There is a good demand for mechanics, especially those in the building trades; wages are high, carpenters receiving 20s. to 22s. 6d. a day, but the cost of rent and food is at least twice as much as in England.

Builders' Notes.

Mr. Edward Lumley, builder, of 24, Castle Street, Merthyr, committed suicide recently.

Newcastle Improvements.—At a meeting of the Newcastle Town Improvements Committee last week plans were presented for the laying out of the Jesmond Park estate. Plans were submitted for an entire re-seating of the Olympia, in Northumberland Road. Plans were approved for a number of new houses in Starbeck Avenue, and also in Dimsdale Road. Plans were also passed for other houses in Simonside Terrace and Goldspink Lane.

Irish Portland Cement.—A correspondent of the "Irish Times" says: "At the Dublin Corporation main drainage works at Pigeon House Fort it is contemplated spending about £40,000 extra in concrete work. Now, as Irish cement was in the original specification, I consider, in justice to native industry, that the contractors should be compelled to use the home product, which I can show is as good as, if not superior to, the German cement used by the present contractors. Compare the chemical analyses of the two Portland cements:—

Irish Cement.			German Cement.		
Silica	-	21.56	Silica	-	21.60
Alumina and Ferric oxide	-	10.10	Alumina	-	8.22
Lime	-	62.44	Ferric oxide	-	1.85
Magnesia	-	1.30	Lime	-	62.18
Sulphured antydrile	-	1.43	Magnesia	-	1.54
Alkalies	-	0.75	Sulphuric acid	-	2.37
Sand and clay	-	1.52	Alkalies	-	0.55
Specific gravity	-	3.160	Loes	-	.75
			Specific gravity	-	3.25

This systematic boycotting of native productions by the Nationalist members of the Dublin Corporation requires some public explanation. More real benefit would be done to the Dublin working man if Irish materials were compelled to be used in contemplated public works; for instance, why not use limestone in place of English bricks for the new fire-brigade station at Tara Street, contract £25,000?"

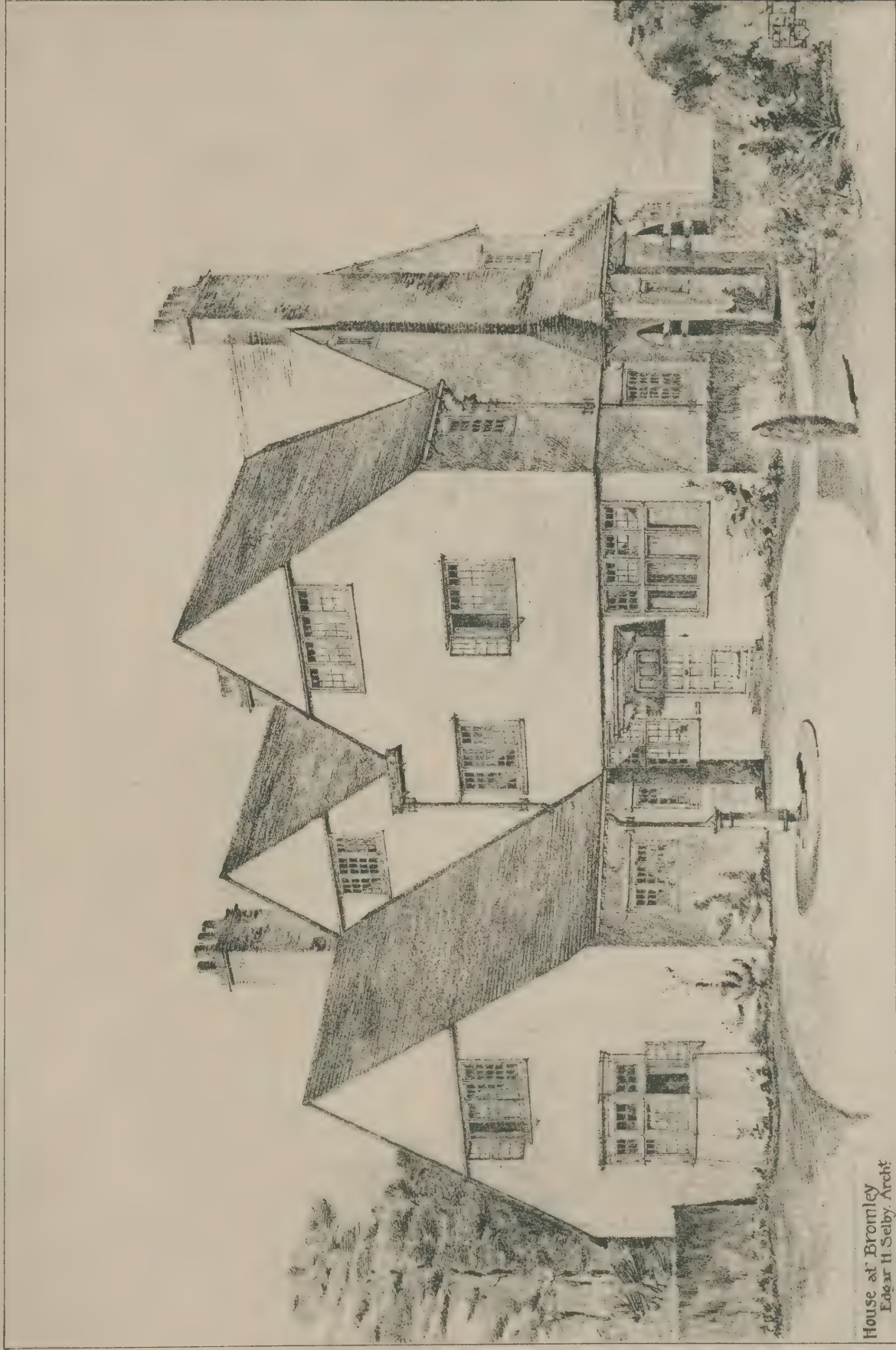
London County Council.—At last week's meeting of the Council the General Purposes Committee reported that they had had under consideration a suggestion that questions relating to the naming of streets and numbering of houses should be transferred from the Building Act Committee to the Historical Records and Buildings Committee. They stated that they had communicated with the two committees, who were both in favour of the proposed transfer. Considerable opposition was offered to this report, but finally it was agreed to.—The Parks Committee recommended a vote of £12,000 towards the cost of laying out 8½ acres of land, known as Fielder's Meadow, adjoining Bishop's Park, Fulham. The cost of the work will be £16,957. The Finance Committee, reporting on the proposal, pointed out that the contribution of the Council was more than half the cost. After much discussion the whole matter was referred back to the Committee.—The Committee further reported that they had considered plans of a music-hall which it was proposed to erect at the corner of King's Road and Sydney Street, Chelsea. The site complied with the Council's regulations, and the building would have accommodation for 2,220 persons. The Committee recommended an intimation from the Council that, provided the works were commenced within six months, a certificate would be granted upon certain conditions for the prevention of fire and panic. The recommendation was agreed to.—The Bridges Committee stated that in connection with the reconstruction for electrical traction of the London County Council tramways between the "Elephant and Castle" and New Cross Gate, it had been found necessary that the bridge carrying Old Kent Road over the Grand Surrey Canal should be rebuilt. The present structure, which belonged to the canal company, consisted of a single-brick arch, the top of which was only 11in. below the surface of the carriageway, and on more than one occasion the attention of the Committee had been called to the inadequacy of the structure for the heavy traffic which passed over it. They now proposed to replace it with a girder bridge at an estimated cost of £3,000. The Council approved the scheme, and authorised the Committee to receive tenders.

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"PHOTO-LITHO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

GAMEKEEPER'S LODGE, BUCK HILL, LOUGHBOROUGH.
 BARROWCLIFF & ALCOCK, Architects.



House at Bromley
Edgar H. Selby, Archt.

"INK-PHOTO." R. J. EVERETT & SONS, 56 LUDGATE HILL, E.C.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

*Where Severn, Trent or Thames's ouzy side
Pours the smooth current of their easy tide,
Each will require a sameness to the spot,
For this a cell, a cascade or a grot.*

(“ART OF ARCHITECTURE.”)

Our Plates.

BUCKHILL LODGE is situated in the heart of the Charnwood Forest, Leicestershire, on the estate of Mr. W. B. Paget, J.P. It is built of granite found near the site, with dressings of local sandstone, stock bricks, and roofed with hand-made tiles, the half-timbering and other exposed woodwork being of English oak. The contractors were Messrs. W. Moss & Sons, Ltd., of Loughborough, and the joiners' work was executed by Mr. W. F. Harding, of Loughborough, under the supervision of Messrs. Barrowcliff & Allcock, architects, of Loughborough.—Some particulars of “Steephill,” Jersey, by Mr. Ernest Newton, will be found on p. 344 of this issue.—Hill House at Bromley, Kent, is nearing completion. It is on South Hill and has been built throughout with stock bricks. The outside has been finished in rough-cast and the roofs covered with Dunton Green red tiles, while the chimney stacks, where shewing outside, are faced with red bricks. The whole of the windows are glazed with leaded lights. A feature has been made of a living-room with large inglenook, and this room and the hall have oak floors. The hall is panelled up to the height of 7ft. 3in. The bathroom, &c., and the cisterns over, are kept all together. The house is fitted with electric light and separate heating is obtained from an independent boiler for the radiators, &c. Mr. Edgar H. Selby, of 8, Buckingham Street, Adelphi, W.C., is the architect, and the builder is Mr. F. P. Duthoit, of Bromley.

THE section of the new Glasgow Technical College, Glasgow and West of Scotland Technical College and Science and Art Buildings, which is to occupy the ground recently acquired from the School Board of Glasgow and the site of Anderson's College, has now been passed by the Dean of Guild Court. The buildings are in the Renaissance style, and are to be built of red sandstone, and, in their entirety, are constructed to accommodate 5,000 students—a number slightly in excess of those attending the college at the

present time. The plans show a structure of imposing size. The portion to be erected at present will run parallel with Montrose Street. On the ground floor will be accommodated the department of natural philosophy. With the exception of two or three rooms to be used for general purposes, the second floor will be devoted to the department of natural science. The third floor will provide accommodation for the department of architecture and building construction, while the chemical department and the department of technical chemistry will be housed on the top floor, the whole of which they will practically occupy in the completed building. Behind the Montrose Street section of the college, and running parallel to it, will be three blocks of buildings. The first block will contain a portion of the electrical engineering department, but will be principally occupied by the examination hall. In the next block the remainder of the electrical engineering department will be housed, while the third block will embrace rooms for woodworking classes and the department of mining and geology. A wing connecting the three blocks will be occupied by the department of prime movers, mathematics and metallurgy. Mr. David Barclay, of St. Vincent Street, Glasgow, is architect of the new technical college. The erection of the new college will necessitate the demolition of the famous building occupied by Anderson's College, which was founded in the year 1796. The existing building, which was formerly the Grammar School of Glasgow, was acquired in 1827 for £3,000, but has since been very much altered.

Improvements at the Lyceum Theatre.

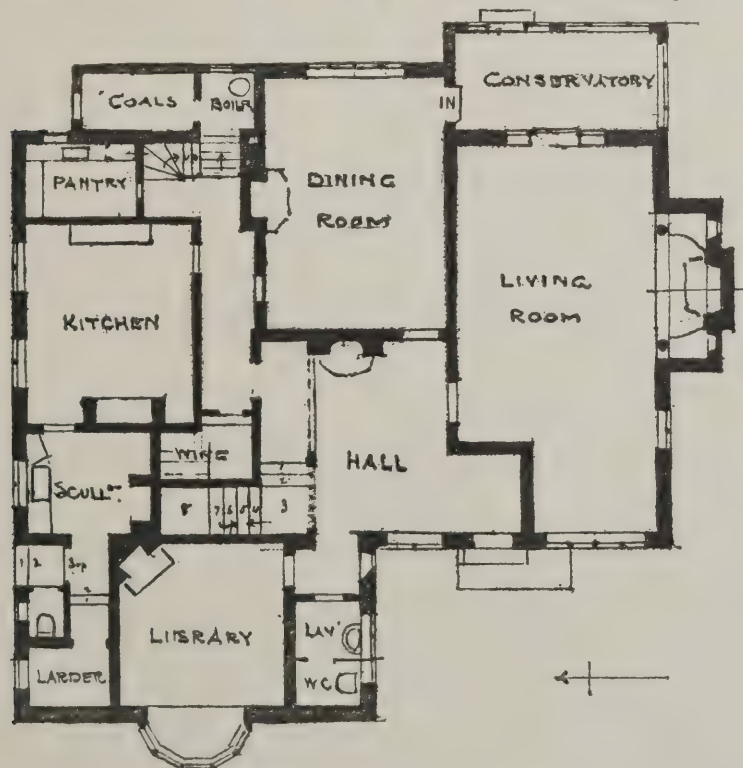
The Lyceum is in many respects the best-equipped of the older West End theatres, but the London County Council decided some time ago that in the interests of the public a good many improvements should be carried out. In October last formal notice to carry out these alterations was served upon the owners. It was decided between the parties that the matter should be submitted to Sir William Emerson, president of the Royal Institute of British Architects, for arbitration. His award will probably satisfy the Council as, with minor exceptions, he decided that all their demands are reasonable. His list of requirements is somewhat formidable, and includes the reconstruction of dressing-room staircases in fire-resisting materials, the provision of adequate exits from dressing rooms, the re-arrangement of workshops, dressing-rooms, stage and auditorium into separate fire risks.

The A.A. Excursion.

BANBURY has been selected as the head-quarters for the Architectural Association Excursion. Members will begin to assemble on Saturday next at the “Red Lion” Hotel, where satisfactory arrangements have been made for accommodation. On Monday, July 21st, the actual work commences, but as breakfast is at 8 a.m., and the excursion starts at 9, it will be necessary for members to arrive not later than Sunday evening. Amongst places to be visited are the following:—Three famous churches, Adderbury, Bloxham and King's Sutton. The mansions and houses include Fritwell, Fawsley (with its beautiful ruined Dower House), Deddington Tower House, Canons Ashby, Chalcombe Priory, Hanwell Castle, Wroxton Abbey, Broughton Castle, Shutford Manor, and picturesque Compton Wynyates. Those travelling from London should give sufficient early notice to the Hon. Secretaries, W. Talbot Brown, Wellingborough, Northants; A. W. Hennings, 9, Ely Place, Holborn, E.C., if compartments are desired to be reserved for them at Paddington on the Saturday afternoon.

BOOTLE FIRE STATION.

A NEW Central Fire Station and District Police Station is being erected at Bootle at an estimated cost of about £32,000. On the ground floor the engine-house will face Strand Road, with the superintendent's and deputy-superintendent's houses on either flank. A superintendent's office will be provided, also a duty-room and clerk's office. The stables will be immediately in rear of the engine-house, divided into two portions by a covered yard; thus, “horses off duty” will be quite isolated from “horses on duty,” and this will secure perfect rest for the former. A harness-room will be provided and also loose boxes. A fire-escape shelter will face Pacific Road, and the engineers' houses and married men's cottages will be placed on either side of the yard, with their backs to Irlam and Pacific Roads. A hose-drying tower and workshop will be also provided. On the north-west corner of the land facing Pacific Road will be the police station, including quarters for a married and single man, charge office and four cells, one of which will be fitted for drunk and incapable persons. On the first floor the single-men's quarters will be situated directly over the engine-house, and every man will have his own separate cubicle, with the use of a common kitchen, mess-room and recreation-room. Sliding poles will be carried down to the engine-room, and a flat over the stable and harness-room will be used as a promenade for the men off duty. The married men's cottages on this floor will be in all cases a repetition of those below them, and access to them will be obtained from balconies reached by central staircases. A washhouse with drying closets will be arranged over the workshop. In the basement there will be accommodation for storage purposes, with coal vaults and the boiler-house for the main heating apparatus. The front elevation of the building will be faced with red pressed bricks and the other portions of the building are to be built in best quality grey bricks, the whole being relieved with red sandstone dressings. Internally the engine-house and cells will be lined with glazed bricks. The following is the schedule of accommodation:—Central Fire Station: One superintendent, one deputy-superintendent, two engineers, sixteen married men and nine unmarried men. Stables: Eight horses and two loose boxes. Engine-house: Three engines, two hose carriages and one ambulance carriage. District Police Station: One married man and one single man. Messrs. Anderson & Crawford, of Dale Street, are the architects, and Mr. Walter Musker, Bootle, the contractor.



HOUSE, SOUTH-HILL, BROMLEY, EDGAR H. SELBY, ARCHITECT.

A Memorial Statue of the late Mr. E. Onslow Ford, R.A., provided by public subscription, is to be placed at the junction of Grove End Road and Abbey Road, St. John's Wood, the locality in which the eminent sculptor resided many years. The care and maintenance of the memorial, after completion, will be entrusted to the Marylebone Borough Council.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Canary Wood.

BIRMINGHAM.—ALPHA writes: "Is canary wood a 'hardwood'?" I asked for a quotation from a leading firm here for some mahogany work. In their estimate they quoted for hardwood, which proves to be canary wood stained. Am I justified in returning the wood as not being a 'hardwood'?"

What is known as "canary wood" is either the wood of *Laurus* or *Persea indica* and *P. canariensis*. *Laurus indica*, or royal bay, is a native of the Canary Islands, and is imported into England under the name of "Madeira mahogany." Varieties are also imported from Brazil, Para, &c. The wood is sound, straight and close in grain, and is used for cabinet work, parquetry, &c. It is hardly to be classed as a hardwood, but we do not think you can object to it being used.

Old Work to Sketch around Derby.

HULL.—TIM writes: "Kindly mention some good examples of old work (ecclesiastic and domestic) within easy cycling distance of Derby suitable to sketch and measure."

Original Gothic work of various periods is to be found in almost all the many villages near Derby, as well as a certain amount of domestic architecture, as the following will suffice to show: Wirksworth—Church of St. Alkmund (1598). Belper—Chapel of St. John Baptist (thirteenth century). Crich—Church of St. Mary (chiefly fourteenth-century, but having a Norman font). Dethick—Chapel of St. John Baptist, founded in thirteenth century, with Late Perpendicular tower, together with parts of the old mansion-house of the Babingtons, which still stand to the east of the chapel. Bonsall—Church of St. James, in Early English and fourteenth-century styles. Wingfield—Manor-house erected in Henry VI.'s reign. Spondon—St. Werburgh's church, fourteenth century, having lep-r window in the north side of the chancel. Elvaston—Castle and Church of St. Bartholomew, with Perpendicular west tower. Breaston—Church of the Early English period. In Derby itself the tower of All Saints' Church is a striking example of Late Perpendicular work, and St. Peter's Church has some fourteenth-century work which is worthy of note.

G. A. T. M.

Minimising Vibration caused by Machinery.

WISBECH.—C. H. P. writes: "Kindly suggest some method of minimising the vibration caused by shafting of heavy machinery. In a case where the bearers (wood) of the shafting are supported upon the wood tie-beams of the trusses, the noise and vibration are found to be very distressing."

It is very difficult to give a useful reply when the question is so vaguely stated. The nature of the machinery is not given, nor the diameter and the speed, or revolutions per minute, of the shafting, &c. "Heavy machinery" is a relative term, and if the shafting is supported by the tie-beams of a wood roof it cannot be so very heavy. Then it is said the bearers are of wood and supported upon the tie-beams, as if the plummer blocks, or pillow blocks, or whatever local name they go by, are of wood instead of, as usual, being of iron with brass steps. If the "bearings" are of wood the speed of the shaft must be slow, and the shaft may not be turned true on its journals, causing vibration. Then again the vibration may not be due to the mode of support, but to the work the shaft has to do, especially if there is any toothed gearing. If the question is repeated with full particulars of the circumstances, it may be possible to suggest a remedy, but not otherwise.

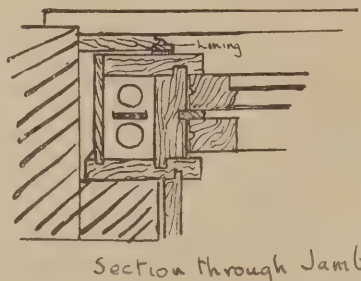
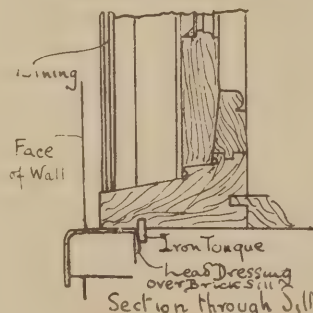
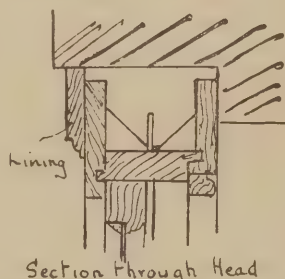
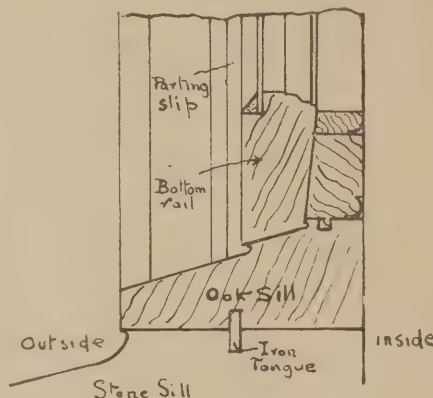
HENRY ADAMS.

Sash Window Sections.

BATH.—G. E. P. writes: "The accompanying drawings show two sections of a framed sash window (not reproduced). They form part of one of my testimonies of studies for the Intermediate Examination, R.I.B.A. Are they correct?"

The section through the head is correct and suitable and efficient in construction, but the section through sill would be better as shown in the first (or top) sketch of those given below.

G. S. writes: "Kindly state how to set the cased frames of double-hung sashes when fixed in the position usual in Georgian work, namely, almost flush with the external face of the wall. Should the reveal be built straight, or would a better form be to (as it were) turn it inside out? I am acquainted with many examples both in old and new work, but owing to linings, casings, &c.,



cannot discover the method by which the weather is excluded. Could you publish some sections through jamb, head and sill showing how this may be satisfactorily accomplished? Also, kindly show an alternative for the sill, dispensing altogether with the stone sill, say by forming one in moulded brick dressed with lead, as in an all-brick building in which the window-sills are the only stone employed; the spotty effect of these is very annoying to me."

The illustrations on this page fully explain the usual manner of setting the cased frames of

double-hung sashes in the external faces of walls. The reveal is a reverse of that where the frames are set back from the face. The face of the frames is protected by a lining about $\frac{1}{2}$ in. or $\frac{1}{4}$ in. from the face of the wall and in a line with the face of the wood sill. In the illustration a brick sill is shown, with lead dressed over it. The bricks project about $\frac{1}{4}$ in. from the face of the wall and are rounded on the top edge. The lead is let in the interior joint and bent over the bricks, and cut off about $\frac{1}{2}$ in. below the lower edge of bricks to make a drip. The sketches are not drawn quite accurate to scale.

Recessed Band Stands.

MONMOUTH.—E. J. writes: "Would a band stand, circular on plan, with one-half recessed in a wall of a building and the other projecting as a semicircular ring of columns, be likely to give good results from an acoustical point of view if the floor and flat ceiling were constructed of wood? What is the average floor space allowed to each performer in a band?"

The acoustical result of any new form of plan is difficult to predict. The form of bandstand you propose would, we think, give good results, but it is not the best shape, for though the enclosure of one-half would tend to throw the sound out, the flat roof would tend to deflect the sound somewhat too sharply downwards, and would not carry nearly so far as a recess semicircular in plan with roof curved elliptically. The average floor space allowed for each performer in a band is 3ft. by 3ft.

Some Margate Buildings suitable for Measurement.

LONDON, N.—R. A. B. writes: "Kindly name some buildings in the neighbourhood of Margate suitable to measure for the R.I.B.A. Intermediate Examination."

The following churches are all more or less suitable for purposes of measuring up:—St. John's Church, Margate, the exterior of which is almost entirely modernised, though some of the windows retain their original rectilinear tracery. There are some trefoiled lancet windows south of the chancel, having good mouldings and shafts to the interior. The nave is of seven bays, with arches of various characters; on the south they are all pointed, some of very plain Early English character, without mouldings, the piers being mostly octagonal; on the north the piers are mostly circular, with Early English capitals. St. Peter's Church, in a village of the same name, is situated close to Broadstairs, and contains a considerable amount of Norman and Early English work, and some of later date. The tower has a curvilinear window of three lights on the west side. Many of the windows have lost their original tracery, which has been replaced by modern restoration. All Saints' Birchington, is a good church, mainly rectilinear in style. The tower is, however, Early English. The church of St. Mary, Minster, is one of the finest churches in Kent, the nave being a fine specimen of pure Norman work and the chancel of beautiful Early English, as also are the transepts, though much plainer in style. Most of the window tracery has been restored, but some of the original still remains. Canterbury is but a short train journey from Margate, and should certainly be visited, as also should Baffreston, whose church is a beautiful specimen of highly-decorated Norman work.

G. A. T. M.

Drawings becoming the Property of the Architect.

SHREWSBURY.—ENQUIRER writes: "What legal cases are there, and where can I find them, proving that all contract drawings, details and specification are the architect's property?"

The case of *Eddy v. McGowan*, reported in the "Times" for November 17th, 1870, decided that if an architect prepared plans and the work was not proceeded with, the employer could claim the plans upon payment of the architect's fees. If, however, the architect is engaged not particularly to prepare plans, but to design and carry out the erection of a building, which he could do without any plans whatever, we do not think the architect could be made to give up the plans, but a case has not been decided on these lines. Several provincial cases have been decided in which the architect had to give up the plans after the building was erected, but these form no precedent, and we

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, July 16th, 1902.



Photo: Albert Smith, Jersey.

"STEEP HILL," JERSEY: MAIN FRONT. ERNEST NEWTON, Architect.

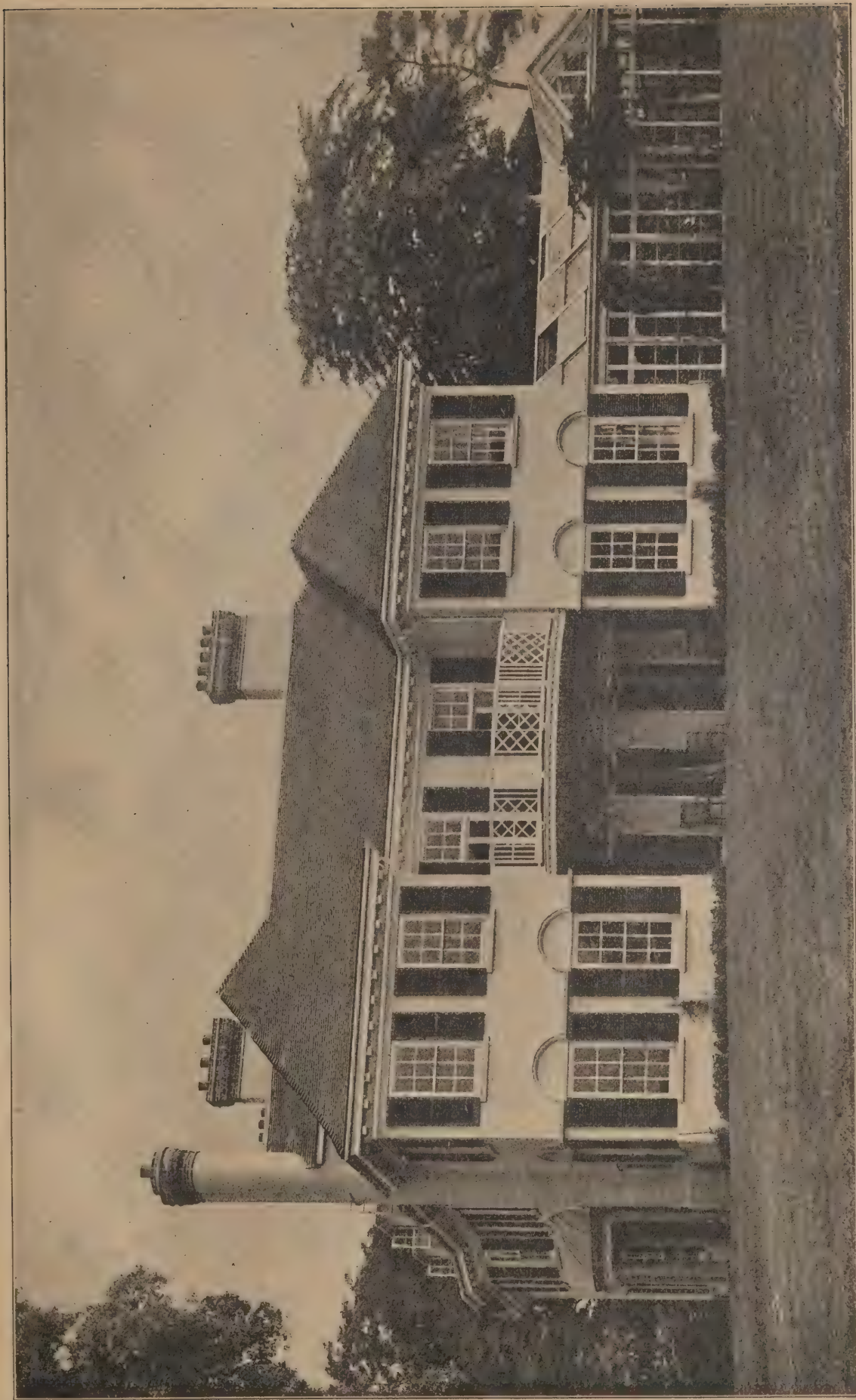


Photo: Albert Smith, Jersey.

“STEEPHILL,” JERSEY: GARDEN FRONT ERNEST NEWTON, Architect.

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think would be reversed on appeal. Our reasons for believing the drawings are the private property of the architect were given on p. 214 of our issue for November 6th, 1901. At the same time, it is always best to include a clause in the general conditions stating whose property the drawings are, and put a note to the same effect on each contract drawing.

Roof Construction.

CHAGFORD.—ARTISAN writes: "Kindly name a book dealing with the practical construction of a roof."

"Roof Carpentry," by G. Collings, price 2s. This can be obtained from Mr. B. T. Batsford, 91, High Holborn, W.C.

Metrical Equivalents for English Tables.

BOLTON.—H. H. C. writes: "I am about to go abroad to work as an architect in a country which uses the metrical system, and so far I have been unable to find any tables to correspond with our 'Hurst' or 'Molesworth.' The latter's 'metrical tables' do no more than compare one system with the other. For instance, 'Hurst' tells us that cast-iron weighs 450lbs. per cub. ft. The 'metrical tables' say how many lbs. there are in a kilogramme and how many cub. ft. in a stere, but what I want is a work which tells how much cast-iron weighs in kilogrammes, &c., per cub. metre."

We do not know of any book in English which will give the information you require. French works on construction, of course, give such information, but there are no books exactly equivalent to Hurst and Molesworth. The reducing of English measurements into their metric equivalents is easily done, and the best method we should suggest would be to work out the calculations in English and turn the results only into metric equivalents.

Purifying Water from Iron.

BRIGHTON.—G. B. S. writes: "Kindly explain how to purify water from traces of iron at a large steam laundry with which we are connected. The water at present causes stains to appear on the linen, and it has been found impossible to use it from the well sunk for such purpose. The pumps raise the water up to two 500gal. tanks (1,000 in all), whence it is carried to the washing machines, &c., and it has occurred to us that some treatment may be possible while the water is in the tanks."

It is desirable to ascertain by chemical analysis whether the iron is originally contained in the water of the well, or whether it is imparted thereto by standing in the iron pipes and tanks, and also what percentage of iron exists. If the water in the well is so impregnated as to stain clothes there is no likelihood of being able to remove the iron by any chemical or mechanical means. It might possibly be utilised as a chalybeate water if it can be served cold in a smart pavilion, with other attractions.

HENRY ADAMS.

LIVERPOOL CATHEDRAL.

A MEETING of the executive committee was held at the Church House, Liverpool, last week. Mr. R. Gladstone in the chair.

It was reported to the committee (a) that in answer to the advertisement inviting architects to submit drawings or other illustrations of their works for the examination with a view to the selection of the architects to compete in the final competition, 102 portfolios had been received. Of these seventeen are from foreign countries and eighty-five from Great Britain. Of the latter, one is from Ireland, eight are from Scotland, and seventy-six from England; of these last, eight are the works of Liverpool architects. (b) That by the courtesy of the library committee, the designs are being hung in the vacant rooms of the Autumn Exhibition, and the selections from those sent in will cover the walls of no fewer than three large rooms. For obvious reasons the committee consider it undesirable to admit the general public to view the drawings at the present stage. The architectural advisers (Messrs. G. F. Bodley and R. Norman Shaw) have arranged to proceed with the examination of the drawings this week, and will report in due course to the executive committee.

Keystones.

New Public Baths, Library and Assembly Rooms at Bootle have been erected in Marsh Lane.

New Fire Station.—A new fire station is in course of erection by the Works Department of the London County Council, at the junction of Grafton Square and Old Town, Clapham.

A New Hydropathic at Buxton is being built in London Road. Messrs. Garlick & Flint, Buxton, are the architects, and Mr. Dickenson, Derby, is the contractor. There will be about sixty bedrooms.

The Suggested County Hall.—At a very early date the Special Offices Committee of the London County Council will bring up a report recommending that a site on the Embankment Gardens should be appropriated for the erection of the County Hall. A perspective view of the proposed building, which will almost face Cleopatra's Needle, has been submitted to the committee, and has been generally approved.

A List of Ancient Buildings in or near Newcastle-on-Tyne compiled for the use of architectural students by Mr. Fred. W. Morgan has been published and presented to the members of the Northern Architectural Association by Mr. J. Walton Taylor, F.R.I.B.A. It is neatly produced and gives most of the Roman, Pre-Conquest, Norman, 13th, 14th, 15th, 16th, 17th and 18th-century-work in the district, arranged in sequence.

A New Miners' Institute at Easton, near Middlesbrough. The building has been built by Messrs. Rage, of Normanby, and consists of a ground floor, containing a games room, billiard room, and reading room. Upstairs are class and committee rooms, which by means of a removable partition can be converted into a lecture hall, capable of accommodating about 200 persons. There is also to be a library in connection with the Institute. The architect is Mr. C. McDermit.

Porcelain Tower.—The models and plans for the porcelain tower which it is proposed to erect on the site of the "Lantern of Diogenes" in the park at St. Cloud, Paris, will shortly be submitted to the Minister of Public Instruction. Trials are to be made with various materials during the winter, and the work will be begun next spring if the money is voted by Parliament. The tower is to be 146ft. high and 26ft. in circumference. The surface will be covered with thirty thousand plaques of Sèvres china, the designs being in light shades of turquoise blue, emerald green and coral pink. The making of the plaques will be spread over about five years, so as not to interfere with the ordinary working of the famous factory at Sèvres.

St. Botolph, Bishopsgate.—The parishioners are much concerned about the safety of their interesting old church in consequence of the proposed construction of three tube railways. At a vestry meeting it was reported that owing to the opposition which had been raised by the parish officers two out of the three Bills which were presented to Parliament had been dropped. The North-East London Railway will, however, run a tube railway through Bishopsgate Street, and it is feared that the church tower may be in danger. Clauses have been added to the Bill providing that 20ft. of London clay must be left between the lowest part of the tower of the church and the top of the railway, and the parish has been protected against any expense which may be caused by disturbances.

A New Village Hall at Scarning has been erected. It is a beginning in the work of making village life more attractive to the dwellers in the villages. The hall, and four five-roomed cottages, the rents of which will be used for the maintenance of the hall, have been erected on an acre of land, from the designs of Mr. Edward Boardman, by Mr. W. J. Lerner, of East Dereham. The hall is substantially built of red bricks and flint, covered in with Bridgewater tiles. It contains an entrance hall and lobby, and a large general room about 25ft. by 30ft., which by means of folded doors may be divided into two rooms. At one end is a small platform, and at the other a gallery approached from the entrance hall. There are also a committee-room and kitchen. The large room contains two fireplaces, and is lighted by leaded windows

The Holly-house Infectious Hospital, Aughton, has been extended by the addition of a new pavilion. Mr. Rawcliffe and Mr. Seward were joint architects.

The Hindley and Abram Grammar School near Wigan is being extended by the addition of a laboratory, lecture room, covered playground, and other rooms at an estimated cost of about £1,600.

At Newport (Mon.) Workhouse a new dining hall has been erected. It is 75ft. long by 37ft. wide, and about 35ft. high to the apex of the roof. It will accommodate about 400 inmates at the tables. Mr. Benjamin Lawrence was the architect, Mr. Dyson Parfitt the contractor, and Mr. W. B. Partington the clerk of the works.

New Public Baths at Liverpool are being erected on a site 6,500 sq. yds., and has a frontage to Listerdrive of 226ft. The buildings are set back 100ft. from the line of the street, provision being made for one swimming bath 60ft. by 30ft., one swimming bath 75ft. by 35ft., and 27 private baths. Space is also reserved for an additional swimming bath when required. The estimated cost of the establishment is £24,000. The plans, &c., were prepared by the baths engineer, Mr. W. R. Court, Mr. Isaac Dilworth, of Wavertree, being the contractor.

A New Nurses' Homes at Guy's Hospital has been erected. The structure is of red bricks and white stone. Every nurse has a separate bedroom. A general dining hall, a sitting-room, a tea-room, and a reading- and writing-room are provided. On the basement floor there is a swimming bath. An extensive engine-room provides motive power for light (all electric), and heat and for the lift. The total number of separate bedrooms provided for the nurses is 210. The cost of the building has exceeded £60,000.

An Architect's Death.—Among the gentlemen summoned on the grand jury at the Middlesex Sessions last Saturday week was William Henry Harroway, an architect, of Winchester Road, Willesden. He did not arrive to time and was fined £10. His non-attendance was accounted for by the fact that he was about to enter the Guildhall, Westminster, in answer to the summons, when he fell and expired immediately. The moment he fell, the police carried him to the Westminster Hospital adjoining, but he was dead on arrival.

The "People's Bath" at Liverpool has been opened in Beacon Street. The building comprises seventeen shower and spray baths, and two ordinary slipper baths. Mr. W. R. Court, the baths and washhouses engineer, was the architect. Messrs. Tomkinson & Sons, Dansie Street, were the contractors for the building work, Mr. Watkinson for the baths fittings, Messrs. Bradford & Co. for the engineering and laundry fittings, and Messrs. John Gibbs & Son for the atmospheric heating. The total cost is £3,500, not including the cost of the site.

A Monument at Carlisle has been erected as a memorial of Queen Victoria. The memorial consists of a bronze statue of her Majesty, 13ft. high, placed upon a 17ft. pedestal of grey Aberdeen granite. It is by Mr. Brock, R.A., and is a replica of the monument of the late Queen which he executed for Hove after the Diamond Jubilee. The site is in the garden portion of the Carlisle Public Park, and has for background the walls of the ancient castle and the trees around it. The cost of the statue was £1,500. There are four bronze emblematic panels in the die of the pedestal.

The new Grand Hotel, Llaniudno, was opened recently. This hotel is the largest in North Wales, providing accommodation for 200 guests, and is located at the foot of the Great Orme, near the Pier Pavilion. The main part of the building, somewhat Georgian in style, is of stone, but above the fourth storey the façade is treated with a pebbled surface. The windows are fitted with green shutters in the Continental style. The entrance hall is in the Georgian style, with a domed roof, supported on pillars in stone and marble. The floor is composed of marble of different colours. The dining-room faces the sea, and is nearly 100ft. long. The building, which has cost over £100,000, has been erected and completely equipped by Waring & Gillow, Ltd., of London and Manchester. Mr. Doyle, of Liverpool, was the architect.

At the Church of All Hallows, East India Dock Road London, a side chapel with a holy table is to be constructed.

A Marble Statue of King Edward VII. at Capetown is to be erected by the Coronation Celebrations' Committee, and Mr. W. Goscombe John, A.R.A., has been commissioned to execute it.

Mr. James Cheetham, J.P., architect, of Park Hill, Rochdale, died recently at the age of sixty-nine. For twenty-five years he was a member of the Rochdale Town Council, serving for years as alderman. In 1893-4 he was elected mayor.

Maldens and Coombe Urban District Council Offices Competition.—Mr. Sidney R. J. Smith, the assessor of the designs submitted for the proposed public offices, has awarded the first premium of £25 to Mr. Hope, the second premium of £10 to Mr. Troup.

A New Building for the Victoria Hospital for Children is being erected in Tite Street, Chelsea, S.W. It will contain six large wards, with ninety-six beds, sixteen in each ward. At the top of the building will be three small self-contained isolation wards for infectious cases.

A New Wesleyan Chapel at Hawksworth is to be erected to accommodate 120 persons, with a small Sunday school and minister's vestry. The building will be in the Gothic style of architecture from designs by Messrs. Walker & Collinson, of Bradford. The tenders accepted amount to about £870.

A New Board School at Sunderland has been erected on the High Barnes estate at the south-west end of the town. The schools are in two blocks, one providing for infants and junior mixed, and the other for senior boys and girls. On the ground-floor of each block the main feature is the centre hall, approached from Wycliffe Road, and connected with the adjoining classrooms. The hall in each case is 53ft. by 29ft., and by including two classrooms, by opening two movable screens at either end, can be extended to over 100ft. in length. In addition to the hall and two classrooms, there are other six classrooms on the ground floor, each capable of accommodating sixty or eighty scholars seated at dual desks, and having a left-handed light. Lavatory and cloak-room accommodation is provided at either end of the block immediately adjoining the staircases, which are constructed of fireproof material, and divided into sections so as to be of easy ascent. The first floor follows on the lines of the ground floor, with the exception that the hall has in each case an open roof. The insides of the classrooms have glazed brick dadoes, but the corridors, staircases, cloak-rooms, &c., are carried on in ordinary red brickwork, pointed, and with brown-glazed dadoes. One corner of the building is erected for the purpose of a cooking centre and accommodation of the caretaker. The whole of the external walls are built in red bricks with moulded brick dressings. The building has cost about £20,000. Messrs. W. & T. R. Milburn were the architects, Mr. J. Elrick was the builder, Mr. J. B. Wilkinson plumber, and Mr. A. J. Carter clerk of works.

Mr. Carnegie's Grants to Libraries.—Mr. A. Carnegie, who recently gave £6,000 for library purposes in Aberdeen, has increased his donation to £10,500. Mr. Carnegie has promised a gift of £8,000 to Barry for the purpose of providing a public library building on condition that a site is provided. The offer has been accepted. Mr. Carnegie is giving £15,000 for the erection of two free library buildings in Paddington, conditionally upon the borough council providing a site and undertaking the maintenance and provision of books. The proposal will be submitted to the council at an early date. He has offered £5,000 for the erection of a public library at Hartlepool. A special meeting of the general purposes committee of the Wakefield Corporation was held recently to consider the offer of Mr. Carnegie to provide £8,000 for the erection of a free public library building for Wakefield on condition that the city adopted the Free Libraries Act, levied the maximum assessment and furnished a suitable site. It was resolved to accept the offer and to take the necessary steps to adopt the Act, and a committee was appointed to consider the question of a site. Mr. Carnegie has also offered to erect libraries at Bridgend and Larne.

A Seamen's Institute at Manchester is being erected at a cost of about £4,000.

Bethel New Church, Bradford, is being erected at the junction of Ryan Street and St. Stephen's Road. There will also be a Sunday school. The church and schools are designed in a plain treatment of early English Gothic. There will be a five-light centre window in the front gable to Ryan Street, with a square tower at the angle, which it is intended to finish with a spire in wood and green Westmorland slates. The church will provide accommodation for 420 persons. The contractors for the various portions of the work are Messrs. J. Moulson & Sons, Mr. J. Bolton, Mr. T. Bolton, Mr. G. Wilkinson and Mr. J. H. Sharp. Mr. W. S. Braithwaite, of Leeds, is the architect.

A New Church in York is being erected for the Leeman Road district. The new church will be known by the name of St. Barnabas. The cost of the building is estimated at about £3,800. The building will be of red bricks throughout, in Gothic style, with brick traceried windows. It will consist of a chancel, 32ft. by 25ft., nave 75ft. by 25ft., aisles, organ chamber, and clergy and choir vestries. The accommodation will be for about 360 worshippers. The architects are Messrs. Hornsey & Monkman, York. Mr. A. Lyons, of Norton, is the contractor for all trades except joiner's and plumber's work, which have been entrusted to Mr. W. Usher and Mr. J. H. Shouksmith, of York, respectively.

A New Roman Catholic Church at Keyham has been erected in Ocean Street. It is a lofty building in the Gothic style of architecture, and has been built of local limestone with Bathstone dressings. The building comprises a nave, with two aisles and chancel, and the entrance is through a porch in the west end. There are clearstory windows. Seating accommodation has been provided for nearly 600 persons, the seats being open and of pitch-pine. In the chancel an altar of oak has been erected. Adjoining the church a presbytery is in course of erection, and land has been enclosed on which it is intended shortly to build day schools. Exclusive of the site, the church has cost about £5,000 and the presbytery an additional £1,300. The church has been built by Mr. R. G. Jenkins, contractor, Devonport, from the designs of the Very Rev. Canon Scoles.

Surveying & Sanitation.

Mr. E. F. Spurrell, assistant surveyor of the Holborn Borough Council, has been presented with a dem-hunter gold watch by his colleagues past and present in commemoration of the twenty-one years' service he has completed.

The Enclosing of Stonehenge.—The Commons and Footpaths Preservation Society held its annual meeting recently. Mr. G. J. Shaw Lefevre, in moving the adoption of the report, said that with regard to the rights of way at Stonehenge the Society had given serious consideration to the matter. They contended that the fencing which had been erected was absolutely illegal and ought not to be permitted. The question would shortly be under the consideration of the County Council, and the society were determined to fight it out. Mr. E. N. Buxton's scheme for reconstituting Hainault Forest, Essex, was one of the greatest that had been undertaken in or near London since the purchase of Epping Forrest. To complete the purchase of that extensive park a small sum was still needed.

The Sanitary Inspectors' Conference was held in Southport on July 4th and 5th. A paper was read by Mr. H. Spears, chief sanitary inspector of West Bromwich, on "Standards in Public Health Work." His conclusions were that, to secure the adoption of such reform, it was necessary that a minister and board of health should be appointed, to whom should be transferred all duties now performed by the Local Government Board, the Home Office and the Board of Agriculture which in anywise affected health, whether in the home or the workshop, and the administration of the Food and Drugs Act. Also, that such board should at the earliest possible moment formulate a new set of standards, which should be absolutely authoritative, but which should be capable of modification from time to time. To secure uniformity of application, the author advocated the gradual reduction of the authorities responsible for sanitary administration, until at last one body should be responsible for both formulation and application of standards, a vigorous protest being made as to the inapplicability of the principle of local option to such matters of Imperial import as public health.

"Woodside," Chilwell.

"WOODSIDE," Chilwell, Notts., was designed by, and is the residence of, Mr. Arthur Marshall, A.R.I.B.A. It is a comfortable house where every care has been taken to make labour and service as easy as possible. The hall is entirely panelled in oak—walls, floor and ceiling—with a fireplace in grey-green glazed bricks built around a "well fire": a similar treatment is adopted in the dining-room, which is 8ft. 6in. high. In the drawing or music-room the wainscoting is of American walnut, the floor being of oak and teak blocks, while the entrance lobby walls are lined with alabaster fixed with gunmetal bosses, and the kitchen, scullery, larder and bathroom lined with white glazed bricks. The larder shelving, wash-tubs and sinks are in white glazed earthenware. Upstairs the accommodation consists of five bedrooms, bathroom, tank-room and a large studio. The whole of the ground floors are formed of Stuart's granolithic stone 3in. thick, supported on 4½in. corbel courses on the walls, with a space of 3ft. or 4ft. beneath. Under the floors the heating pipes are carried, so that the air is always warm and dry.



"WOODSIDE," CHILWELL, NOTTS: FRONT ENTRANCE.
ARTHUR MARSHALL, A.R.I.B.A., ARCHITECT.

New Patents.

These patents are open to opposition until August 18th.

1901.—Cement Kilns.—13,413. F. KILBY, Pylle, near Shepton Mallet, Somerset. The kiln is of brickwork about 31t. by 3ft. by 6ft. high, with parallel sides, and is arranged for a forced draught.

Street Gulleys.—15,098. M. BROOK, 66, King Street, Huddersfield. Inside the gully is fixed (when required) a packed flange covering the outlet and connecting with a pipe that projects outside and is connected with the flushing hose. By these means the whole pressure of the water is exerted at each flushing and there is no escape.

Paint Sprayers.—22,575. W. SEEBOLD, 96, Heidenkampsweg, and C. G. A. MARTIN, 35, Hammerlandstrasse; both of Hamburg. The paint is held in a cast-iron container, attached to the side of which is a storage cylinder for compressed air. The apparatus is thus very portable. In the end of the nozzle is a central diffusing pin, and the spray can be regulated by sliding the cap on the nozzle.

1902.—Water Valves.—2,657. A. STROMBERT and R. ROTH, both of 17, Rue St. Paul, Antwerp. Between the tap and the service-pipe an automatic stop-valve is fixed. This is actuated when the tap is removed, so that there is no necessity to shut off the supply when executing repairs.

Apparatus for Laying Concrete.—3,976. J. T. DEMPSEY, 650, South First Street, Kansas City, U.S.A. The materials are discharged into small buckets which run on a line of rollers laid on the ground. At the end of the line the bucket is tipped and is returned empty on rollers arranged at the side of the first set. The whole is portable.

Concrete Iron Arches.—6,871. J. JAEGER, 4, Pelikanstrasse, Zurich. The arches, instead of resting on girders, are arranged between ribs strengthened at the top with a metal bar.

Earthenware Pipe Joints.—8,563. J. TANSLEY, 2, Westbourne Road, Bedford. This invention relates to improved mechanism by which pipes with a bayonet jointing can be produced at a low cost. The slots and lugs are formed in connection with an ordinary extrusion pipe press.

The following specifications were published on Thursday last, and are open to opposition until August 25th. A summary of the more important of them will be given next week. The name in italics is that of the communicator of the invention.

1901.—12,698, EWEN, glass grooving, cutting, bevelling and ornamenting. 13,019, GREGORY & MORTIMORE, ventilating sewers, drains, &c. 13,076, MEIN, tile-making machine. 14,533, LEWIN & LEWIN, ball-taps. 14,551, BARWELL, BARWELL, KIMBERLEY & SMITH, chandeliers, electric-light fittings, &c. 14,689, OATES, chimney pot. 15,662, DISS, combined camber beam and supporting devices for turning arches. 15,887, RILEY, drain traps. 15,972, TEMPLETON, cramping device. 16,136, WILSON, supporting tramway rails and securing their joints. 16,213, BATES, valves or cocks. 16,215, BRIDDEN, pipe-union seal attachment. 16,484, WHITE & COATES, water sprayers. 16,491, GILBERT, incandescent gas lighting. 16,594, GARVENS, pumps. 17,654, ALFORD & MARTIN, ventilation by window openings. 18,087, KUGHLER, safety appliances for elevators. 19,108, CAMPBELL & GALLOWAY, ranges. 20,643, BERHENKE, apparatus for drying bricks, &c. 23,294, IMMICH, earth conductors for lightning conductors. 26,095, WATTS, combination pocket wire cutters.

1902.—4,488, GILFILLAN, free-arm drawing board. 6,663, HEESCH & LANGE, recording hoisting devices. 7,594, LEDRU, acetylene gas generating plant. 7,739, GRAHAM, covering for floors. 8,276, WINTER, warming apparatus for rooms. 9,017, FAWCETT, PRESTON & Co., LTD., & BOWERS, manufacture of slabs or blocks. 10,072, CLASSEN, disc for polishing marble plates. 10,088, THOMPSON (*Richter*), artificial pavements. 10,310, STAPLETON, tripods for surveyors' levels, &c. 10,356, KEYES, manufacture of plate glass. 10,606, CHAFFER, door bolts. 11,186, ROTH, securing and stretching paper on drawing boards.

SOUTH KENSINGTON EXAMINATIONS.

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—HONOURS: Part II.

[The questions and answers in the Elementary Stage were published in our issue for May 7th last; those in the Advanced Stage in our issue for May 14th; and those in Honours, Part I., in our issue for May 28th.]

DIVISION I.

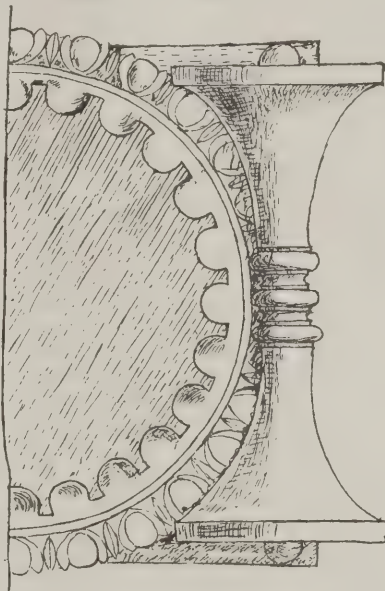
61. Answer only one of the following (a) or (b):—

(a) What are the Elgin Marbles? Where are they? To what building did they mainly belong? Who were the architects of the building? And who was the sculptor who had supervision and control of the sculpture? or (80)

(b) Sketch a Greek Ionic capital. (Credit will not be given for the sketch if it is carelessly done.) (80)

(a) 1. Sculptures in marble brought from Greece by Lord Elgin in 1805. 2. In the British Museum. 3. To the Parthenon, Athens. 4. Callicrates and Ictinus. 5. Phidias.

(b) (See accompanying illustration. The sketch should show that the student has an exact knowledge of an Ionic capital.)

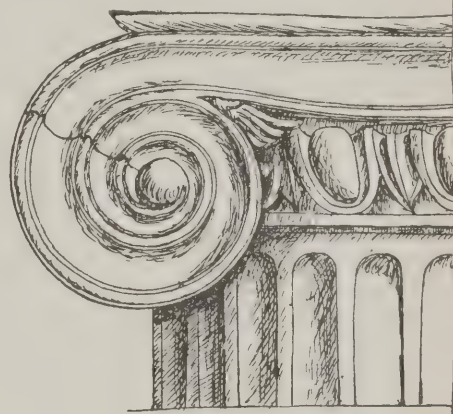


b. Henry VII.'s Chapel. 3. The western towers; Early Perpendicular.

(b) Heavy battered towers in Egyptian architecture. (See accompanying illustration.) The walls are carved, showing various figures (one carving sketched); there are also door openings (not shown).

DIVISION II.

63. Write full instructions for a specification for a bridge of a single arch to carry a 20ft. roadway over a stream (the instructions should refer to the general conditions of the contract as well as to the actual works, but they are to be no more detailed than is necessary to enable an assistant to draw up the full specification). The centre line of the stream makes an angle of 60 degs. with that of the road: there is a good rock foundation at the level of the bed of the stream: abutments 6ft. high (to springing from rocky bed): span, at right angles to centre line of stream, 20ft.: arch segmental on cross-section, at right angles to the centre line of the stream, having a rise of 8ft.: banks of stream 6ft. over bed, 30ft. from bank to bank. The road and fences are carried on filling which slopes 1 to 1 to level top of river banks. The general work is to be masonry, built with Portland-cement mortar, showing squared uncoursed wide-jointed rubble in faces. Copings to be through stones, not laid on a prepared continuous bed, but rising from the uncoursed masonry, chisel-drafted along top corners and smooth-dressed on top. The sheeting is to be of blue bricks in cement-mortar. Make such sketches as will sufficiently direct your office assistant to make accurate drawings. (80)



SOLUTION TO QUESTION 61(b).

*62. Answer only one of the following (a) or (b):—

(a) Plan of Westminster Abbey. In what style is the greater part of the building? Transfer the plan to your paper. Indicate where you would take a friend to show him (a) Saxon and Norman work, (b) Late Perpendicular work. What important portion was built in the beginning of the eighteenth century, and what style is imitated in this work? (80)

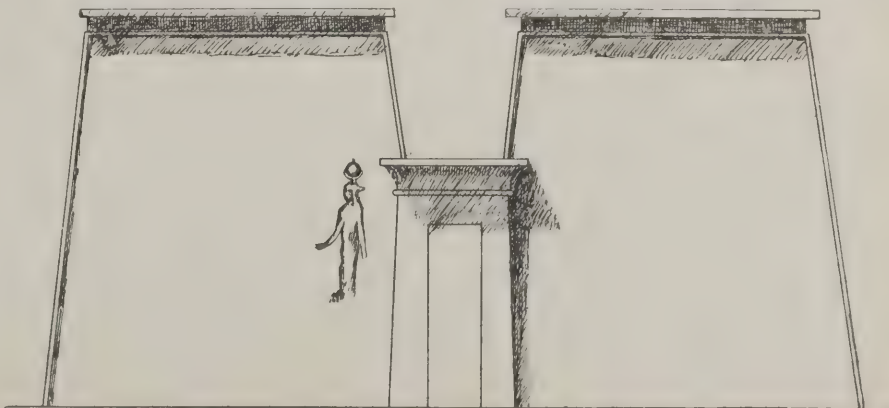
(b) What are pylons? Sketch neatly the elevation of a building showing pylons. (80)

(a) 1. Early English. 2. (Plan not reproduced.) a. Buildings lying outside the south-east corner of the cloisters; old refectory.

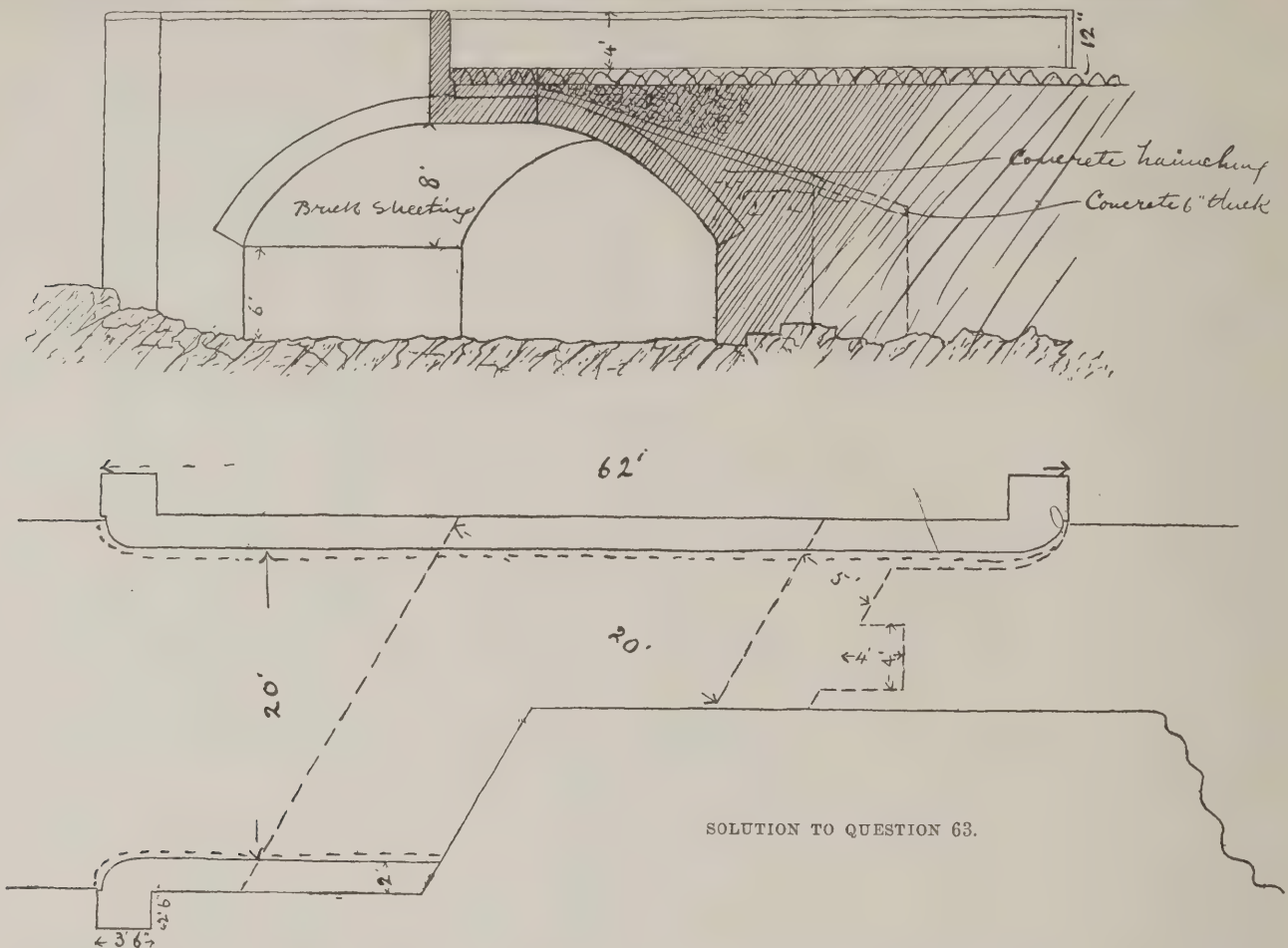
(See sketch on next page, drawn approximately to scale, freehand on squared paper.)

The assistant is assumed to know the form of specification in general use in the office; and it is only necessary to note for his guidance the special circumstances of the proposed bridge: it is unnecessary to repeat the conditions stated in the question. Work to be done by contractor.

(a) Make contractor responsible for safety of the public; provide for lighting and watching. (b) Road traffic must not be interrupted for more than one month. (c) Contractor to supply all plant, labour, materials; all damming, pumping, &c.; to serve notices on owners, &c.; to be liable for all damages, accidents, storms and floods; must not trespass outside limits authorized.



SOLUTION TO QUESTION 62(b).



SOLUTION TO QUESTION 63.

(d) Payment to be in two instalments, viz., 85 per cent. of the contract sum on completion of work within two months of the date of signing agreement and remaining 15 per cent. after two months. (e) Excavation to be made sufficient to get in the masonry and to remove any loose or soft material anywhere on the site of the works. Refilling earthwork and forming roadway; reinstatement; clearing up; filling to be of material that will not "settle," to be well rammed; foundation for pitching for roadway; pitching; broken stones 2in. gauge. (Assume river shallow and bed favourable.) (f) Owing to rock foundation, footings not required; where sloping, to be dressed in steps; where loose, removed. (g) Quality of cement and other material, tests. (h) Masonry, &c., as in question. (i) Carry parapets in continuation on retaining walls to meet the road fences. (j) The road being 26ft. wide inside the fences, and the roadway over bridge 21ft., turn out parapets at ends and put neat terminal pillars 3ft. 6in. by 2ft. 6in., against which earthen road fences finish. (k) Abutments 5ft. thick of solid masonry, with two abutments 4ft. by 5ft. outside. (l) Centering to be sufficient to be true; lagging to be fairly close and with good true surface. (m) Coursing spirals to be laid down truly on lagging for first ring of sheeting. (n) Sheetings to be in four half brick rings (thick beds and joints everywhere), mortar 3 to 1; coarse, sharp, gravelly sand. (o) Keep stone-work clean, leave ends of sheeting bricks uncut. (p) Neatly finish wide tuck-pointing. (q) Centering strong; lagging fairly close; finish of soffit neat, to show bricks. (r) Sheetting to be brought up from skewbacks equally so as to balance on centering. (s) Complete to satisfy engineer in every particular. Penalties—if traffic interrupted for more than a month; work not completed within a total time of two months (leave blanks).

64. The walls for a stable have been built, and a hayloft has been constructed over the stable; this floor has been pugged. Openings have been formed for door (7ft. by 4ft.) and two windows (each 5ft. by 4ft.) in one side wall (long dimension); they are placed symmetrically with reference to the outside of the wall. The space within the walls is 28ft. by 18ft., and the lower edges of the joists are 12ft. over the level of the door sill. Write full instructions

for a specification for (a) the windows and door; (b) floor and drainage to be carried to an outfall through the wall opposite to the door; (c) plastering and such finishing of walls as you think advisable; (d) stall divisions and other fittings; (e) water supply, hay supply, ventilation, vermin prevention. Draw such neat dimensioned sketches as will enable a draughtsman to make accurate drawings. (80)

The stable will be fitted for one stall in centre and two loose-boxes. (a) Frames of windows of 4in. by 3in. rebated to take sashes, and with oak sills to bed on stone window sills; sashes of 2in. stuff; lower sash fixed in frame in eight panes; dimensions of sash, 3ft. 3in. high, 4ft. 2in. wide; top sash, 4ft. 2in. wide, 1ft. 8in. high (or thereabout); bed oak sill on stone sill in white lead. Stone sill to be weathered to extend inside oak sill, and to have $\frac{1}{2}$ in. lip rising inside. Give window jambs 60 degs. splay; splay soffit the same amount; jamb line with lin. stuff, and put $\frac{1}{2}$ in. window board (woodwork inside to be varnished). Top sash to hinge at meeting with lower to open inwards for ventilation, with curved rack supports. Door to open outwards; lower door 4ft. high in one piece, to open flat to wall on heavy cranked hinges. Top portion in two parts, each to open back to wall strong cranked hinges with fasteners (old-fashioned shutter pattern) to keep them open in fine weather. You will find working drawings for these doors and fastenings—"Stables for Millmount," drawer 15. (b) Carry 4in. drains direct from horse-pot positions through wall to one point of wall, so that they may be cleaned out from this point on the outside, provide room for this purpose, put on grating to keep rats out of these drains. Complete 4in. drain from this connecting chamber to outfall, give proper fall; remember ventilation and straight runs. For floor put on hard foundation 6in. of concrete (Portland cement; specify quality and tests, &c.), pave with best stable bricks, laid to proper falls. (c) Walls inside boxes and across stall to be sheeted with $\frac{1}{2}$ in. thick tongued and grooved sheeting; care to prevent harbour for vermin between, and wall solidly fastened at floor. Tile walls to loose-box fittings, height over sheeting—say 2ft. 8in. of tiling. Outside loose-boxes finish wall in cement plaster 4ft. over floor to ceiling; render, float and set grey finish. Ceiling same, on good double laths. (d) Fit complete

—& Co.'s stable fittings. Loose-boxes, 11ft. by 13ft. 6in.; stall, 6ft. wide 10ft. deep. (e) Bring water supply to side of door; have cock outside and cock inside; see that pipe is out of the way of frost. Arrange for hose attachment outside and inside. Traps and pigeon ladders at ends of gangway for hay supply. Put three iron ventilating windows in back wall. —Co.'s, catalogue No. Bottom 9ft. over floor.

(Note.—Students are asked to give sketches. The sketches should show details of windows and door of an ordinary kind; they are here omitted, and reference given to supposed former work at Millmount.)

DIVISION III.

65. Take accurate quantities for the bridge of question 63; price them and write out a detailed estimate. (80)

2	28	10	5	2 800	Abutments.		
4	9	4	4	576	Buttresses.		
2	31	15	3	2,790	Retaining walls.		
4	11	3 5	2 5	735	Pillars.		
2	17 5	8	3	840	Spandrels.		
2	61	2	4	976	Parapets.		
				8,717	322 cub. yds. masonry.		
	32	24	1 75	1,344	49½ cub. yds. brickwork in sheeting.		
2		28	6	336	Face abuts.		
2		60	21	2,520	Faces bridge.		
2		65	4	520	Parapets roadside.		
				3,376	sq. ft. facework, less bridge opes.		
2		23	6	276	} Bridge opes.		
2		11 5	8	184			
				460			
				2,916	324 yds. super. facework.		
				32	24	768	85½ yds. super. facework intrados.
2		68	2	272	ft. super. dressing tops of parapets.		
30 yds.				7 yds.	210	yds. super. road surface.	
				200	cub. yds. excavation and filling.		
						Damming, &c.	
						Centering, watching, risk of accidents, reinstating.	

	£	s.	d.
200 cub. yds. excavation 1st removing 2nd filling, 2s. - - -	20	0	0
210 yds. super. road surface, complete, 3s. - - -	31	10	0
Damming, say - - -	10	0	0
Centering " - - -	20	0	0
Watching, risk and reinstating -	15	0	0
322 cub. yds. masonry at 15s. -	241	10	0
49½ " " brickwork in sheeting at 40s. - - -	99	0	0
324 yds. super. facework at 2s. -	32	8	0
85½ " " intrados, 2s. -	8	10	8
272ft. super. dressing tops of parapets, 1s. - - -	13	12	0
Add profit and contingencies, 15 per cent. say - - -	74	2	0
	£565	12	8

66. You are commissioned to prepare a design with complete drawings and specifications for a school to cost £8,000, to advertise and arrange for tenders, and to supervise and control the work as architect and agent for the proprietors. Write out in detail, and as nearly as you can in order and sequence, the steps by which you will perform this work. You are to treat of (a) design; (b) drawings and copies; (c) specification and copies; (d) quantities and copies; (e) advertisement for tenders and selection of a contractor; (f) agreement; (g) appointment and control of clerk of works; (h) portions of the work, such as steam-heating, laundry, electric plant, &c., as to which you think consultation with specialists necessary. (80)

Accommodation required considered. See how I can most economically place it.

(a) Cube and see what quality of work, &c., I can afford. Submit your rough proposals. After discussion, and the final decision arrived at as to accommodation and character of building and work, (b) proceed with the regular drawings: ground plan showing connections with other buildings and situation of main building with respect to them; plan of each floor and roof plan: four elevations, two cross-sections—all to the scale of $\frac{1}{8}$. Enlarged drawings of such parts as cannot be properly shown to this scale. Assuming that the work is to be submitted in competition to contractors, every part of the work should be carefully made clear by drawings. Cornices, mouldings, &c., should be drawn full size, and full provision made that there will be no cause of complaint in regard to any explanatory or subsequent detail drawings; these drawings should be finished as tracings, and prints should be taken so as to have copies for intending contractors. (c) The notes for the specification should proceed with the drawings, and when the drawings are completed in pencil the specification should be regularly written out from the notes, and it should be printed or manifolded by means of a typewriter and office printer. (d) Copies of the drawings and specification should be given to the quantity surveyor (or surveyors); he should prepare the quantities, which he may either manifold with a typewriter or have lithographed from his own manuscript. (e) Advertisement should state where the proposed building is situated, who the persons are for whom it is to be built, the date and place of receiving tenders, where plans, specifications, &c., are to be seen and form of tender obtained: it should safeguard the proprietors against any claims for compensation of any kind. "Messrs. So-and-So-and-So-and-

So, quantity surveyors, have had an opportunity of taking the quantities": the name of the architect should be given. (f) The solicitor for the proprietors, in consultation with the architect, should prepare the contract or agreement. (g) Clerk of works should be appointed by the architect; he should be absolutely under his control, and dismissable by the architect without notice. (h) Definite amounts should be named in the specification for the works suggested, and they should be executed by firms making specialities of these things, the architect being empowered to get such expert advice as he considers necessary on such terms as may be agreed upon.

67. Describe: (a) Office modes of producing multiple copies of drawings, (b) manifolded typewriting, (c) manifolded manuscript, (d) storing drawings so as to be carefully kept and easy of access, (e) arranging files of correspondence for easy reference in connection with particular works, (f) record of certificates, (g) record of expenses. (80)

(a) Tracing: transparent tracing-paper laid on drawing and lines traced in Indian ink: tracing on stout drawing paper, using glass drawing-board and light from beneath, using a tracing as a photographer uses a negative to print on photographic paper: using tracing to produce a negative—white lines on a dark brown ground and from this brown lines on a white ground: using tracing as a negative gives either white lines on blue ground (easiest to manipulate) or dark lines on a white ground. (b) Six or seven copies may be obtained by using six or seven sheets of paper with carbon paper between: using prepared tissue to form a stencil by typing, then printing through stencil with printer's ink. (c) Form stencil writing with steel point on prepared paper, having finely-cut file underneath, &c.; print through with printer's ink (this is also available for rough sketches): write with aniline ink and transfer writing to a gelatine pad; this will now give thirty to forty copies. (d) Keep drawings opened flat in drawers, which should be numbered and referenced. (e) Have a (file) drawer for each work, keep a small memorandum book in each drawer, make up the letters of each correspondent separately and in order of date; refer to letter-book for replies. (f) Mark certificates in pass-book, refer to No. in certificate-book, keep block certificates. (g) Record expenses in pass-book and post in ledger.

*68. Draw to the scale of $\frac{1}{8}$ elevations of fronts A and B of the thatched cottage shown. Specify carefully with minute detail (a) the operation of thatching, (b) forming reveals to door and windows, (c) rough-casting of walls, (d) how the surface of the ground is to be finished along the walls. (80)

(See accompanying illustrations.)

(a) I assume that the timbers have been put up, that they are sufficient, and that the foundation of tough fibrous turf carefully cut in long continuous rolls has been properly placed on the timbers, which have been bridged across either with branches or with sawn laths. The best straw for thatching is good long sound rye straw: if the thatch is to be as heavy as shown in the drawing, it must be put on in several coats. (The operation of thatching is described in our issue of December 18th, 1901.) Where scollops are to be bent sharply they are first brused by striking them with the mallet. With good straw properly put on, the thatch

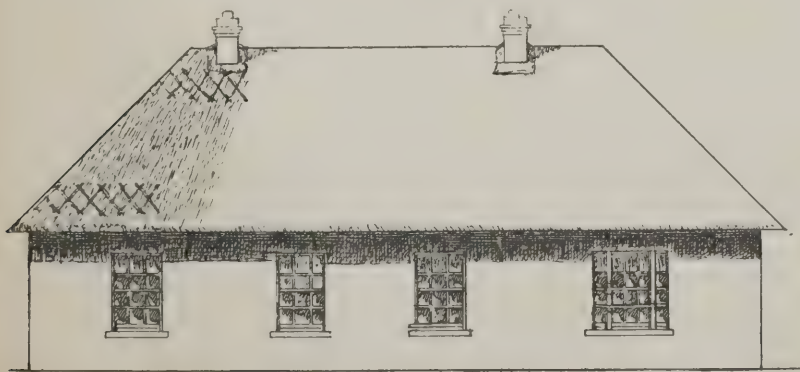
should not require any dressing with the knife on the finished surface: the eaves will require dressing. (b) Rake out the joints well, fix pieces of $\frac{3}{4}$ in. straight edges (nail to walls) to give the true ope. Wet well, plaster with cement-mortar (3 to 1) between window frame and straight edge, float true: remove straight edges, trim cement-plaster to show uniform edge, which should project beyond face of wall; finish off edge with float. (c) Plaster walls, rough float on one coat: throw on rough-cast carefully with small wood spades, protect windows, doors, &c. (d) It is inconvenient to put eaves gutters to thatched roofs; the ground at bottom of wall should be able to withstand the drip and splash from the eaves, and it should be shaped so that there will be little splashing of the water upon the walls. The eave should have a good projection (2ft. shown on the drawing). The old plan was to neatly pave with rounded water-worn pebbles set in sharp clean sand on a hard foundation, a margin about 4ft. wide. (The arrangement of thatch should be such as prevent drip over doors.)

69. Design a fireplace, grate, mantel, and overmantel and cornice in a drawing-room. Height of ceiling from floor, 13ft. Sketch so much of each proposed separate detail as may be necessary to show accurately what is intended at every part of the work. These sketches should be very neatly done. (80)

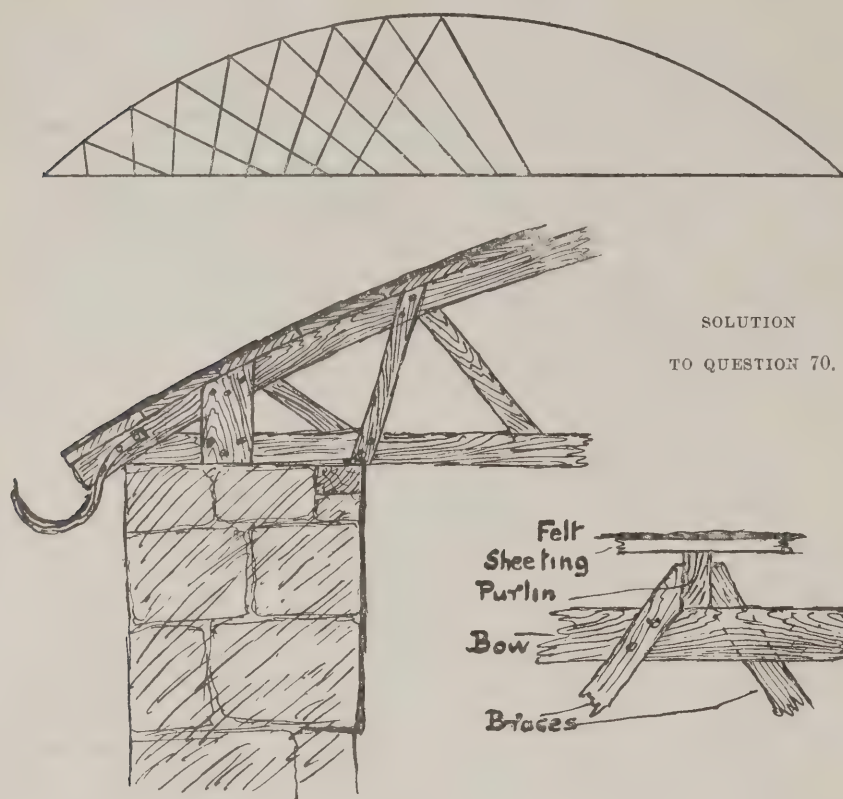
It is unnecessary to give this drawing. The design should be tasteful: the drawing should be neat, and credit may be expected to be given for economy of work. The drawing should not be a picture: it should be a business drawing, completely descriptive, with the minimum amount of labour on it.

70. You have to cover a rectangular space, and the walls enclosing it, with a wagon roof of sheeting felted and the felt tarred. Inside dimensions 80ft. by 30ft., walls 18in. thick. Write down accurate detailed instructions for (a) making and bracing the ribs—with sketches; (b) spacing and bearing on walls; (c) sheeting, felting, tarring; (d) eaves gutters and spouting; and any details that may occur to you. Make the roof thoroughly strong and secure. Take off and make up the quantities accurately, and draw up a detailed estimate for the work. (80)

If it is attempted to cover a plane roof with felt it will be found that wind getting inside will blow the felt from the sheeting and the heads of the nails will be insufficient to keep it down. In this respect a curved or wagon roof is much better; any wind from the inside blowing the felt off at one part tightens it at other parts, and the friction of the felt against the sheeting adds enormously to the value of the nails. (a) There are two ways of constructing these roofs: the cheapest way is with ribs 8ft. apart, light purlins 4ft. apart, and the sheeting of $\frac{3}{4}$ in. deals bent to the curve nailed to the purlins; the felt is nailed to the sheeting with broad-headed nails; it is given sufficient lap, and it is then well-tarred with well-boiled coal-tar, and finally well sprinkled with dry sharp sand. The ribs are bow-string girders; the curvature need not be very considerable, and a bow of 5½ in. by 1½ in. can easily be bent to it if laid down on a floor of planking. The string may also be 5½ in. by 1½ in.; bow and string should be each in one piece of clean timber. The bracing may be of 3 in. by 1 in. pieces, spiked to the bow and string and to each other where they cross. In making these



SOLUTION TO QUESTION 68.



lattices the positions of the purlins are marked on the bow, an angle is chosen for the bracing which may be slightly varied, but the bracing is fixed with reference to the purlin so that a normal at the point would bisect the angle and the bracing comes upon the string irregularly. Another way is to make the ribs lighter, put them 4ft. apart, and sheet on them with lin. sheeting without purlins. I shall adopt this plan for the roof of the question. (Note.—Roofs of this description are sometimes made covered with heavy canvas instead of roofing felt.)

(b) The walls are finished square and level on top, having a 5½ in. by 3 in. wall plate along inside face, the 3 in. flush with face of wall and the 5½ in. flush with the top; this wall plate should be well held down by pieces of 2 in. by ½ in. strap iron, looking over it above and well fastened to the wall some distance down, say 4ft. The ribs are well fastened down to the wall plate, and all care is taken to provide for a possible upward pressure of wind as well as the downward pressure. Spaced 4ft. apart from centre to centre.

(c) Sheet with 9 in. by 1 in. boards; take the usual precaution to break joint at headings. (I assume the sheeting planed inside surface and the ribs also planed, so that if care is taken to prevent tar touching this "cleaned" timber it may in the end be painted.) Nail on the felt in horizontal courses, giving 2 in. laps, and tar the laps; ¾ in. broad-headed nails; boil the tar well, add mineral pitch; use the tar hot; sprinkle with suitable clean dry sand. (d) Owing to careless tarring tar runs into the eaves gutters and down spoutings: these should be roomy. A pocket should be provided at the bottom of each down spout to retain surplus tar, and the eaves gutters should have considerable fall to the down spoutings.

Quantities and Estimate.

	£	s.	d.
In one rib 10 cub. ft. sewn timber at 3s. - - - - -	1	10	0
Carpenter's time making, and nails - - - - -	0	15	0
Cost of one rib - - - - -	2	5	0
Say 29 ribs - - - - -	65	5	0
Sheeting, 80ft. by 38ft., 50½ squares lin. sheeting nailed on, at £1 - - - - -	30	10	0
Felt, 340 sq. yds. nailed on, at 8d. - - - - -	11	6	8
Tarring at 6d. - - - - -	8	10	0

	£	s.	d.
Eaves gutters 5 in. half round, 28 lengths at 2s. - - - - -	2	16	0
12 lengths down spouting at 6s. 8d. - - - - -	4	0	0
4 heads and 4 shoes at 3s. 6d. and 2s. 2d. - - - - -	1	2	8
Hooks and fixing - - - - -	3	0	0
Wall plates, 20 cub. ft. at 3s. - - - - -	3	0	0
Fixing wall plates - - - - -	1	0	0
Iron straps, say 30 each 20lb., 600 lbs. at 2d. - - - - -	5	0	0
Fixing straps - - - - -	1	0	0
	£136	10	4

New Companies.

Lifrot, Dawber & Co., Ltd.

Registered to carry on the business of brick, tile and pottery makers and merchants, manufacturers of pipes and artificial stone, marble and stone merchants, &c. Capital £1,000 in £1 shares.

Rickmansworth Gravel Co., Ltd.

Registered to carry on the business of producers of and dealers in gravel, sand, loam, chalk, limestone, builders' materials, &c. Capital £5,000 in £1 shares. The first directors are C. B. Waller, J.P., A. F. Bolt and W. Stennett.

G. Pearce & Son, Ltd.

Registered to acquire as a going concern the business of sawmill proprietors, timber merchants, manufacturers of articles of all kinds in which timber is used, now carried on by G. Pearce & Son. Capital £2,500 in £1 shares (2,000 preference). The first directors are G. Pearce, J. Pearce and E. G. Knights.

T. Westlake & Co., Ltd.

Registered to acquire the business carried on by T. Westlake and T. Westlake, junior, at Calstock and Gunnislake, Cornwall, and at Rumleigh, Devon, as Westlake & Co., and to carry on the business of brick and tile, pipe, pottery and artificial stone manufacturers, stone and marble merchants, &c. Capital £8,000 in £1 shares. The first directors are T. Westlake, junior, W. H. Fortescue and J. Ashford.

Albany Stables, Ltd.

Registered to carry on the business of property owners, agents, surveyors, architects, builders, contractors, merchants, &c. Capital £1,500 in £1 shares. Registered office: 9, St. Mildred's Court, E.C.

Marsh, Son & Gibbs, Ltd.

Registered to acquire as going concerns the business of quarry proprietors, Bath stone merchants and masons, carried on by Marsh, Son & Gibbs, Ltd., at Box, Corsham, Lampley Stoke and Bath, and also the business of stone and granite merchants carried on by Tildesley, Shepherd & Mabson at 11, Great Western Road and Mileage Wharf, Paddington, and Canterbury Road Wharf, Kilburn, to acquire certain quarries at Hartham Park, Corsham, Wiltshire, and also at Pickwick, Corsham, and, generally, to carry on business as stone merchants, dealers in lime, cement, bricks, slate and terra-cotta. Capital £100,000 in £1 shares (50,000 preference). The directors are R. J. Marsh, F. H. Gibbs, J. Shepherd, W. W. Mabson, B. D. Pope, and G. A. Line. Registered office: Northfield House, Box, Wiltshire.

Co-operative Freehold House Property Investment Trust, Ltd.

Registered to acquire, deal with, work and turn to account any real or personal property and estates, houses, shops, buildings, freehold, leasehold, copyhold or of any tenure; to lay out land for building purposes, and to carry on business as water, gas and electrical engineers; builders, contractors and decorators; dealers in building materials, brick, tile and terra-cotta makers. Capital £25,000 in 1s. shares. Registered office: 64, Mycledon Square, E.C.

Italian Sculptured Marble Co., Ltd.

Registered to acquire under an agreement with Dottridge Brothers the business carried on by the Italian Sculptured Marble Co., Ltd.; to develop and extend the same; and, generally, to carry on the business of marble merchants, builders, sculptors and masons in the United Kingdom or elsewhere; to erect any buildings, plant and machinery. Capital £40,000 in £1 shares. Registered office: 283, Kingsland Road, N.

Central Park Estates Co., Ltd.

Registered to carry on the Central Park Estates, Canvey Island, the business of an electric light company; to acquire and turn to account any real or personal property, lands, estates, &c. Capital £15,000 in 5s. shares. Registered office: Station Road, Canvey, Essex.

Purfleet Chalk Quarries, Ltd.

Registered to carry on the business of quarry owners and workers, miners, brick, cement and pipe manufacturers, builders, contractors, &c. Capital £30,000 in £10 shares. The first directors are C. O. Trechmann and O. K. Trechmann.

Glass Houghton Collieries, Ltd.

Registered to carry on the business of colliery proprietors, miners, engineers, ironfounders, smiths, brick, tile, and pipe-makers, lime burners, cement makers, &c. Capital £200,000 in 100,000 deferred ordinary and 100,000 preferred ordinary shares of £1 each. The first directors are W. M. Wood, H. S. Child, H. C. Embleton, and H. W. Hollis. Registered office: Glass Houghton Collieries, Castleford.

W. A. Sheppard, Ltd.

Registered to take over the business of a steam-roller and traction engine proprietor, haulier, and contractor carried on by W. A. Sheppard, of Bath, and to carry on the same and any auxiliary business. Capital £2,000 in £1 shares. W. A. Sheppard is the first sole director. Registered office: Bank Chambers, Quiet Street, Bath.

Nock Llantwit Colliery Co., Ltd.

Registered to acquire the business of colliery proprietors, coal miners, ironmasters, slate, slat, and stone quarry owners, brickmakers, &c. Capital £7,000 in £1 shares. Registered offices: 12, Mount Stuart Square, Cardiff.

TENDERS.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Addressed postcards on which lists of tenders may be sent will be sent post free on application to the Manager, BUILDERS' JOURNAL, Effingham House, Arundel Street, Strand, W.C.

ASHBY-DE-LA-ZOUCH.—For sewerage works at Ashby-de-la-Zouch. Mr. J. B. Everard, M.I.C.E., engineer, 6, Millstone Lane, Leicester.

C. Chamberlain, Leicester...	£1,031	3	8
Bentley & Loch, Leicester...	1,043	5	9
Johnson & Langley, Leicester...	1,033	3	2
Slater & Sons, Ashby-de-la-Zouch...	1,406	16	3
T. Philbrick, Leicester...	1,374	8	6
J. R. Holmes, Leicester...	1,340	0	0
E. Orton, Coalville...	1,235	6	10
R. W. Barker, Harrogate, Yorks...	1,225	6	0

BASFORD.—For certain alterations and additions at the workhouse, for the Guardians. Mr. W. V. Betts, architect, Bank Omces, Old Basford.

T. Cuthbert, Hyson Green, Nottingham...	£1,300	0	0
W. Savage, Hyson Green, Nottingham...	1,250	0	0
G. Hopewell & son, Old Basford, Nottingham...	1,250	0	0
W. J. Hutchinson, Old Basford, Nottingham...	1,214	10	0
H. Ingham, Old Basford, Nottingham...	1,209	14	0

BIRKDALE.—For the erection of a chapel and lodge, Liverpool Road south, for the Urban District Council. Mr. Albert Schofield, architect, 45 Wold Road, Birkdale. Quantities by the architect:—

T. Spencer...	£2,000	0	0
Hallwell Bros...	1,072	0	0
Duxfield Bros...	1,002	11	3
Irvine & Sons...	1,849	12	0
T. Wright, Birkdale...	1,815	10	0

BRIGHTON.—For the erection of two new pavilions at the borough sanatorium, Bear Road, Brighton, and the execution of other works in connection therewith. Mr. Francis J. C. May, M.I.C.E., F.S.I., borough engineer:—

Rowland Bros, Horsham...	£25,280	0	0
W. & E. Nokes, Esherbourne...	23,285	0	0
J. Longley & Co., Crawley...	24,869	0	0

CANNOCK (STAFFS).—For alterations, &c. to Rawnsley Schools, for the School Board. Messrs. Bailey & McConna, architects, Bridge Street, Walsall. Quantities by the architects:—

J. Dallow...	£455	0	0
Smith & Son...	2,350	0	0
W. Vistance...	2,369	0	0
F. Sprenger...	2,044	6	0
A. C. Hughes...	1,995	0	0
M. B. Anderson...	1,925	0	0
Smith & Son...	1,925	0	0
L. & R. Barton...	1,915	0	0
W. H. Gibbs...	1,870	0	0
T. Mason, Hednesford...	1,810	0	0
Walton Bros...	1,787	5	0

CIRENCESTER.—For re-building the "Brewer's Arms" Inn, Cricklade Street, for Messrs. T. & J. Arkell. Messrs. William Drew, M.S.A., & Sons, architects, Regent Circus, Swindon. Quantities by the architects:—

G. F. & E. Newcombe...	£1,250	0	0
Drew Bros...	1,230	0	0
Saunders & Sons, Ltd...	1,191	0	0

CONGLETON.—For laying about three miles of 3-in. and 4-in. water-mains in the township of Church Lawton, for the Congleton Rural District Council. Mr. C. R. Hall, engineer, 1 West Street, Congleton:—

W. Lawton, Congleton...	£1,475	0	0
J. Stringer, Sandbach...	1,188	0	0
T. Rowland, Sandiway...	1,188	8	0
A. Lee, Alton...	1,180	0	0
J. Dale, Northwich...	1,099	14	0
F. Burke, Stoke...	1,093	0	0

CRICKLADE.—Accepted for the erection of house, Fiddle Farm, Cricklade, for W. B. Heberden, Esq., C.B. Messrs. William Drew, M.S.A., & Sons, architects, Regent Circus, Swindon:—

T. L. Franklin, Cricklade...	£425	0	0
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DUNDEE.—For the construction of a steel girder bridge over the Caledonian (Dundee and Perth) Railway, near Ninewells Junction, together with relative masonry and other works, for the Dundee Town Council (Section No. 1) masonry, &c.; (No. 2) steel, &c. superstructure. Mr. Wm. Mackison, engineer, 91 Commercial Street, Dundee:—

Somervail & Co., Dalnair...	£4,982	4	0
R. Sheach, Meadowside...	4,508	18	0
J. Bruce, Loches...	4,456	10	11
J. Binnie & Co...	4,417	0	0
D. K. Symington...	4,314	0	0
A. & T. Craig, West Clepington Road...	4,235	17	6
J. O. Brettell, Worcester...	2,093	7	0
Somervail & Co...	2,073	3	0
A. Findlay, Motherwell...	1,854	10	0
J. Binny & Co...	1,923	0	0
R. Sheach...	1,920	11	0
D. K. Symington...	1,918	11	0
Brandon Bridge Building Co., Ltd., Motherwell...	1,850	11	0
Motherwell Bridge Co., Ltd., Motherwell...	1,750	0	0
A. & T. Craig...	1,730	0	0
Beath & Keay...	1,700	11	0
Arrol's Bridge & Roof Co., Ltd., Germiston Works, Glasgow...	1,678	7	0

HENGOED (WALES).—For the erection of 20 houses at Hengoed, for the Hengoed Building Club. Mr. P. Vivian Jones, P.A.S.I., architect, Hengoed:—

T. F. Howells, Caerphilly...	£3,900	0	0
J. F. Davies & Co., High St., Bargoed, via Cardiff...	3,920	0	0
D. Williams, Elliott's Town, New Tredegar...	3,900	0	0
J. H. James, 13 Kincraig Street, Cardiff...	3,900	0	0

KINGSGATE.—For the erection of the White Cottage, Kingsgate, near Broadstairs, for Mr. A. C. Norman, J.P. Messrs. Swan & Norman, architects, 3 Clifford's Inn, Temple Bar, E.C. Quantities by Mr. James H. Swan:—

Paramor & Sons...	£2,500	0	0
Brown & Son...	2,490	0	0
F. G. Minter...	2,490	0	0

KIRKCALDY.—Accepted for the erection of new cookery and class rooms at Gallatoun Public School for the Dysart Burgh School Board, for Messrs. A. R. A. B. A., architect, Kirkcaldy. Quantities by the architect:—

Baird Bros, Masons, Sinclairtown...	£217	7	0
D. Wishart, Joiner, Pathhead...	722	3	7
Robert Page, Slater, Pathhead...	78	0	0
John Eaton, Plasterer, Kirkcaldy...	308	2	0
Byth & Dougall, Plumbers, Sinclairtown...	304	1	7

Total ... £2,220 14 2

LONDON, W.—For the erection of a new workhouse at Wormwood Scrubs, for the Hammersmith Board of Guardians:—

S. W. Moscrip, Willesden...	£225,370	0	0
Wimpey & Co., Hammersmith...	218,320	0	0
R. L. Tonge, Jubilee Road, Watford...	216,000	0	0
W. Wisdom, Isleworth...	215,000	0	0
C. Wall, Chelsea...	214,274	0	0
J. E. Johnson & Son, Leicester...	212,000	0	0
S. Santo, Westminster...	209,763	0	0
J. Smith & Sons, Ltd., South Norwood...	208,827	0	0
J. Dorey, Brentford...	208,504	0	0
C. Deering & Son, Islington...	208,150	0	0
C. Appleby, Lambeth...	207,744	0	0
D. E. Wallis & Sons, Maidstone...	207,480	0	0
J. C. Lesher & Sons, Bow...	207,109	0	0
A. E. Kenneth & Sons, Ltd., Willesden...	205,825	0	0
J. T. Hockley, Brompton...	205,500	0	0
Patkinson & Sons, Westminster...	205,218	0	0
Kilby & Gayford, Worship Street...	204,002	0	0
McCormack & Son, Northampton Street, Essex Road...	203,084	0	0
C. F. Kearney, Kensington...	203,403	0	0
C. Lawrence & Sons, City Road, N...	203,383	0	0
C. Gray Hill, Coventry...	203,330	0	0
F. D. Winter, Westminster...	199,875	0	0
Holliday & Greenwood, Ltd., Brixton...	199,544	0	0
B. E. Nightingale, Albert Embankment...	199,208	0	0
Clarke & Randall, Woolwich...	197,744	0	0
J. Shillitoe & Sons, Bury St. Edmunds...	195,000	0	0
H. Wilcox & Co., Wolverhampton...	193,500	0	0
W. Hopkins, Birmingham...	193,450	0	0
W. Williams, Pontypool...	192,420	0	0
T. Rowbotham, Coventry...	187,777	0	0

NEWTON ABBOT.—For the following works in the parish of Bovey Tracey, for the Newton ABBOT Rural District Council: (1) the carting and laying and pointing of about three miles of cast-iron pipes, 4 in. and 3 in. diameter, together with all contingent work in connection therewith; (2) the construction of an open reservoir, to hold about 3,900,000 gallons, about 2½ miles from Bovey Tracey:—

E. R. Lester, London...	£5,820	0	0
J. C. Laing, Liskeard...	5,531	1	4
Hawking & Best, Teignmouth...	5,518	10	0
W. C. Shaddock, Plymouth...	5,187	10	0
Stephen & Son, Ltd., Exeter...	4,877	5	5
Woodman & Son, Exeter...	4,781	12	0
M. Bridgman, Paignton...	4,541	16	10
Dart & Pollard, Paignton...	4,497	0	0
W. Gibson, Exeter...	4,236	10	2
A. Jenkins, Southwell, Notts...	4,217	12	10

REIGATE (SURREY).—For the erection of a villa at Reigate, for Mr. C. E. Robinson. Messrs. Holland & Sons, architects, High Street, Newmarket. Quantities not supplied:—

Buckland & Waters...	£1,207	0	0
G. Martin...	1,143	0	0
Bagally & Sons...	1,177	0	0
Nightingale & Sons...	1,137	0	0
R. Killick...	1,160	0	0

SOUTHALL (MIDDLESEX).—For the erection of isolation hospital, for the Southall-Norwood Urban District Council. Mr. G. E. T. Lawrence, A.R.I.B.A., architect, 22 Buckingham Street, W.C.:—

Kimberley, Banbury...	£11,248	0	0
Kellett, Willesden...	10,921	0	0
Higby & Rabson, Thames Ditton...	10,835	0	0
Godson, Kilburn...	10,319	0	0
D. Nightingale...	9,967	0	0
General Builders, Limd...	9,838	0	0
Thomas & Edge, Woolwich...	9,755	0	0
C. G. Hill, Coventry...	9,610	0	0
G. Minter, Westminster...	9,500	0	0
C. Voxall...	9,471	0	0
A. & B. Hanson...	9,430	0	0
Almond & Sons, Fonders End...	7,977	0	0

SPRINGFIELD (near CHELMSFORD).—For the erection of a small detached residence, Queen's Road, Springfield, for Mr. Leach. Messrs. Clara & Ross, architects and surveyors, Chelmsford, and 1 West Street, Finsbury Circus, E.C.:—

F. Weight...	£845	0	0
F. Johnson...	800	0	0
W. Fincham...	775	0	0
Moss & Co...	671	0	0

STOKESFIELD-ON-TYNE (near NEWCASTLE).—Accepted for the erection of a detached house on a new building estate. Messrs. Clara & Ross, architects and surveyors, Chelmsford, and 1 West Street, Finsbury Circus, E.C.:—

Geo. Watson & Son, Stocksfield...	£708	0	0
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SWINDON.—Accepted for additions to No. 27 Curtis Street, for Mr. J. H. Carpenter. Messrs. William Drew & Sons, architects, Regent Circus, Swindon:—

Tydemans Bros, Swindon...	£214	12	0
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SWINDON.—For the erection of new stables at the "King's Arms" Hotel and "Lord Raglan" Inn, Swindon, for Messrs. T. & J. Arkell. Messrs. William Drew, M.S.A., & Sons, architects, Regent Circus, Swindon:—

Tydemans Bros...	£390	0	0
J. Lay...	330	0	0
A. J. Colborne...	305	0	0

SWINDON.—Accepted for the erection of new latrines, Even Swindon Schools, for the Swindon School Board. Messrs. William Drew, M.S.A., & Sons, architects, Regent Circus, Swindon:—

Tydemans Bros, Swindon...	£630	0	0
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[Four tenders received.]

TRECYNON (ABERDARE).—Accepted for the erection of free library and public hall at Tre cynon, Aberdare. Mr. C. H. Eiford, M.S.A., architect, Aberdare:—

D. T. Davies, 73 Mill Street, Tre cynon, Aberdare...	£2,050	0	0
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WALSALL (STAFFS).—For the erection of a new infants' school and cookery kitchen, Whitehall, Walsall, for the School Board. Messrs. Bailey & McConna, architects, Bridge Street, Walsall. Quantities by architects:—

Smith & Son...	£4,846	0	0
W. Vistance...	4,438	0	0
T. Tildesley...	4,707	0	0
T. Mason...	4,408	0	0
T. Mallin...	4,578	0	0
Smith & Pitts...	4,200	0	0
Willcock & Co...	4,569	0	0
J. Dallow...	4,124	0	0
W. & J. Webb...	4,525	0	0
J. W. H. Gibbs...	3,900	0	0
S. Wootton...	4,522	0	0
Heath, Birmingham...	3,900	0	0
Brockhurst & Wood...	4,504	0	0

WEST CORNFORTH (DURHAM).—For the erection of a club, hall and managers' house at West Cornforth, for the Cornforth and District Working Men's Social Club Company, Limited. Mr. H. T. Gradon, architect, Market Place, Durham:—

Ward Bros, Middlesbrough...	£1,093	0	0
T. Lazouby, Ferryhill...	1,084	0	0
G. T. Manners, Durham...	1,649	0	0
D. D. Hall, Gateshead...	1,540	0	0
J. T. Mann, Cornforth...	1,492	9	0
R. Telfer, Spennymoor...	1,420	10	0

* Accepted.

At St. James's Church, Blackburn, a tower is to be added. The plans of Mr. A. R. Gradwell, of Victoria Street, were accepted, after reference to and approval by Messrs. Paley & Austin, church architects, of Lancaster. The tower, which will be of stone, will rise to a height of 85ft., and be surmounted by a slated spire and a vane, making a total height of 120ft.

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DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
BUILDING:			
July 17	Leeds—Cement	Sewerage Committee	City Engineer, Leeds.
" 17	London, N.W.—Coach-house and Stabling	St. Pancras Guardians	A. E. Pridmore, 2 Broad Street Buildings, E.C.
" 17	Falmouth—Classroom	School Board	W. Jenkins, 39 Church Street, Falmouth.
" 17	London, N.W.—Boundary Wall, &c.	Hampstead Borough Council	O. E. Winter, Town Hall, Haverstock Hill, Hampstead.
" 17	Cardiff—Additions to Offices	Tramways Committee	Veall & Sant, Architects, Cardiff.
" 17	Egremont, Cumberland—Alterations, &c.	J. Jardine	J. S. Stout, 36 Lowther Street, Whitehaven.
" 17	Leeds—Extending Car, Painting Shed, &c.	Ancient Order of Foresters	City Engineer, Leeds.
" 17	Port Talbot, Wales—Ten Houses	Kent County Council	F. B. Smith, Architect, Port Talbot.
" 17	Dublin—Alterations, &c., Lecture Hall	Sevenoaks Rural District Council	C. Farren, 14 Granby Road, Dublin.
" 18	Chartham, near Canterbury—Repairs, &c., to Asylum	Meers, Foster	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
" 18	Durham—Bridge Works and Police Station	Parish Council	W. Crozier, County Surveyor, Shire Hall, Durham.
" 18	Mountain Ash, Wales—Chapel	Parish Council	G. A. Trehanne, Engineer, Aberdare.
" 18	Penshurst, Kent—Eight Workmen's Cottages	Market Committee	Clerk, Penshurst Parish Council, Penshurst.
" 18	Whitby—Farm Buildings	School Board	E. H. Smales, 5 Flowergate, Whitby.
" 18	Edinburgh—Additions to Laundry Buildings, &c.	Corporation	M'Arthy & Watson, 25 Frederick Street, Edinburgh.
" 18	Edinburgh—House for Pothouse Governor	Corporation	R. M. Cameron, 24 George Street, Edinburgh.
" 18	Belfast—Public Abattoir	Co-operative Society, Ltd.	City Surveyor, Belfast.
" 18	Sherborne, Dorset—Repairing, &c., Police Station	Union Guardians	E. A. Ffooks, Clerk to Standing Joint Committee, Sherborne.
" 18	Bala—Schools	Sherburn Hill Co-op. Soc., Ltd.	R. L. Jones, Architect, Station Road, Bala.
" 19	Manchester—Underground Lavatories	Corporation	City Surveyor, Town Hall, Manchester.
" 19	Manchester—Wall-tiling at Underground Lavatory	Corporation	City Surveyor, Town Hall, Manchester.
" 19	Sherburn Hill, Durham—Converting Schools into Stores	Co-operative Society, Ltd.	H. T. Gradon, Architect, Durham.
" 19	Edenderry, Ireland—Repairs to Workhouse	Urban District Council	H. R. Waters, Engineer, Edenderry.
" 19	Shotton, co. Durham—Stores	Urban District Council	H. T. Gradon, Architect, Durham.
" 21	Kingston-upon-Thames—Library	Corporation	J. A. Cox, 4 Adam Street, Adelphi, W.C.
" 21	Finchley, N.—Electricity Generating Station	Urban District Council	E. Calvert, 2 Broadway, Finchley, N.
" 21	Coventry—Alterations, &c., to Premises	Union Guardians	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.
" 21	Coventry—Workhouse Alterations	Union Guardians	T. F. Tickner, 7 Bishop Street, Coventry.
" 21	North Evington, Leicester—Infirmary	Guardians	Giles, Gough & Trollope, 28 Craven Street, Charing Cross, W.C.
" 21	Glasgow—Extension of Central Station Hotel	Caledonian Railway Company	J. Miller, 15 Blythswood Square, Glasgow.
" 21	Aberdare—Alterations, &c., to Inn	Aberdare and Treycynon Brewery Co., Ltd.	J. L. Smith & Davies, Architects, Aberdare.
" 21	Aberthillery and Llanhilleth, Wales—Stables and Stores	Urban District Council	J. McBean, 1 King Street, Aberthillery.
" 21	Brithdir, Wales—Twelve Cottages	Building Club	E. A. Johnson, Architect, Merthyr.
" 21	Grimsby—Electrical Works	Corporation	W. A. Vignoles, Borough Electrical Engineer, Grimsby.
" 21	Leeds—Underground Conveniences	Markets Committee	City Engineer, Municipal Buildings, Leeds.
" 21	Leicester—Infirmary	Guardians	Giles, Gough & Trollope, 28 Craven Street, Charing Cross, W.C.
" 21	Luton—Galleries at School, &c.	School Board	J. R. Brown & Son, Architects, Castle Street, Luton.
" 21	Upper Owmbrian, Wales—Renovation of Church	Bethel Church	T. Williams, Secretary, Upper Owmbrian, Wales.
" 21	Belfast—Goods Shed	Harbour Commissioners	G. F. L. Giles Harbour Engineer, Belfast.
" 21	Cardiff—Altering School	J. Groves & Son	R. & S. Williams, Architects, Borough Chbs., Wharton St., Cardiff.
" 21	Liverpool—Lavatory Accommodation at Workhouse	Urban District Council	H. J. Hagger, Vestry Clerk, Parish Offices, Liverpool.
" 21	Bridport—Additions, &c., to Inn	District Council	F. Cooper, Architect, Bridport.
" 22	Walthamstow—Gas House	School Board	E. J. Gowen, Clerk, Town Hall, Walthamstow.
" 22	London, N.W.—Observation Block at Hampstead	Urban Sanitary Authority	O. C. Robson, Engineer Public Offices, Dyne Road, Kilburn, N.W.
" 22	Cannock, Staffs—School	Commissioners H.M. Works, &c.	Bailey & McJannet, Architects, Bridge Street, Walsall.
" 22	Workington—Eighteen Houses	School Board	Borough Surveyor, Town Hall, Workington.
" 22	London, W.C.—Foundations for Land Registry Offices	School Board	H. Tanner, H.M. Office of Works, Storey's Gate, S.W.
" 22	Balderton, near Newark—School	School Board	Saunders & Saunders, Architects, Arcade, Newark-on-Trent.
" 22	Bettws, Wale—School Alterations and Additions	School Board	D. Edmond, Clerk, Chapel Bach, Llangonoed, near Bridgend.
" 23	Aldershot—Stables, Cart Sheds, &c.	Urban District Council	N. F. Dennis, Surveyor, Aldershot.
" 23	Carmarthen—Boiler and Engine House	Union Guardians	Clerk, Joint Counties Asylum, Carmarthen.
" 23	Lewes—Board Room and Offices	G. W. & G. C. Rlys. Joint Committee	H. Card, 10 North Street, Lewes.
" 23	Aldershot—Alterations, &c., to Brewery	Co-op. Agricul. and Dairy Soc., Ltd.	Friend & Lloyd, Architects, Aldershot.
" 23	High Wycombe—Thirty-six Cottages	Sewage Committee	Chief Engineer, Great Western Railway, Paddington, W.
" 24	Manningham—Furniture Depository	Llanwanno School Board	C. E. Marsden, 3 John Street, Bradford.
" 24	Bailieborough, Ireland—Creamery	G. R. Burnett	T. M. Farrelly, Bailieborough.
" 24	Bury, Lancs—Alterations to House	Urban District Council	A. W. Bradley, Borough Engineer, Bury.
" 24	Penrhiwceir, Wales—School Alterations, &c.	Health Committee	S. Shipton, Clerk, Town Hall, Mountain Ash.
" 25	Seascale, Cumberland—Gymnasium	Corporation	W. L. Mason, Architect, Kelsick Road, Ambleside.
" 26	Elland, Yorks—Refuse Destructor, &c.	North-Eastern Railway Company	Surveyor, Council Offices, Elland.
" 26	Bristol—Hospital Extensions	Commissioners of H.M. Works, &c.	T. H. Yabbloom, 63 Queen Square, Bristol.
" 28	Wolverhampton—Covered Market	Race Stand Co., Ltd.	G. Green, Borough Engineer, School Street Depot, Wolverhampton.
" 30	Cross Gates—Station Buildings, Platform Roofing Warehouse, Stationmaster's House and Cottages	Urban District Council	W. Bell, Company's Architect, York.
" 31	Southampton—Telegraph Office	Urban District Council	H.M. Office of Works, &c., Storey's Gate, S.W.
Aug. 1	Carlisle—Grand Stands, &c.	Electricity Committee	J. Graham, Architect, Bank Street, Carlisle.
" 2	Tottenham—Fire Station, Depot Buildings, &c.	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
" 6	Bradford—Store and Three Houses	Co-operative Society, Ltd.	W. Rycroft, Architect, Bank Buildings, Manchester Rd., Bradford.
" 11	Chesterfield—Infirmary, Nurses' Home, &c.	Union Guardians	Rollinson & Son, 13 Corporation Street, Chesterfield.
ENGINEERING:			
July 17	Gillingham, Kent—Electrical Plant	Urban District Council	W. H. Trentham, 39 Victoria Street, Westminster, S.W.
" 17	Manchester—Electric Locomotives	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept. Town Hall, Manchester.
" 18	Epsom—Electrical Plant	Urban District Council	E. G. Wilson, Clerk, Council Offices, Epsom.
" 18	Marlborough, Wilts—Extension of Water Mains, &c.	Rural District Council	Fairbank & Son, 13 Lendal, York.
" 19	Hadleigh, Suffolk—Boring	Rural District Council	A. Newman, Clerk, Churchgate Street, Hadleigh.
" 19	Portunna, Ireland—Wheel Pump	Urban District Council	M. Lavan, Clerk, Workhouse, Portunna.
" 19	Mexborough—Dynamo	Corporation	H. Waring, Electrical Engineer, Mexborough.
" 19	Glasgow—Girdler Bridge, &c.	Urban District Council	J. M. Gale, 45 John Street, Glasgow.
" 19	Matlock—Driving Adit	Royal Victoria Infirmary	J. Diggle, Engineer, Town Hall, Matlock.
" 21	Newcastle-upon-Tyne—3 Boilers, &c.	Kent County Council	W. Sutton, jun., Prudential Buildings, Mosley Street, Newcastle.
" 22	Yalding, Kent—Bridge	Urban District Council	E. W. Ruck, 85 Week Street, Maidstone.
" 22	Bishop's Stortford—Electric Lighting	Lancs and Yorks Railway Company	T. Swathesridge, Clerk, Council Offices, North St., Bishop's Stortford.
" 22	Brighouse, Yorks—Widening Line	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
" 22	Brighouse—Division of Lane	Corporation	Engineer, Hunt's Bank, Manchester.
" 23	Drogheda, Ireland—Reservoirs	Town Council	L. Donegan, Secretary, Gas and Water Office, Drogheda.
" 23	Motherwell, Scotland—Waterworks	County Asylum	J. McMillan, jun., Engineer, Outlet Waterhead, Bgar.
" 23	Devon—Electric Lighting Plant	Urban District Council	O'Gorman & Cozens-Hardy, 82 Victoria Street, Westminster.
" 23	Sydney—Street Electric Lighting	Urban District Council	Preese & Cardew, 8 Queen's Gate, Westminster, S.W.
" 25	Southrough, Kent—Pumping Station	Corporation	G. & F. W. Hodson, Engineers, Loughborough.
" 25	Londonderry—Heating	Corporation	R. E. Buchanan, Engineer, Castle Street, Londonderry.
" 26	Glasgow—Main Drainage Works	Corporation	Office of Public Works, 64 Ochrane Street, Glasgow.
" 26	Rawtenstall, Lancs—Excavating, &c.	Corporation	A. W. Lawson, Borough Surveyor, Municipal Offices, Rawtenstall.
" 26	Huelva, Spain—Thirty Waggon	Lighting Committee	Secretariat of Port Works, Huelva.
" 26	Madrid—Tramway Extension	Union Guardians	Public Works Department, Madrid.
" 27	Azuaga, Spain—Electric Lighting	North-Eastern Railway Co.	Commercial Intelligence Branch, Board of Trade, 50 Parliament St.
" 28	Sydney, Australia—Electric Cables, &c.	War Office	Deputy Postmaster-General, Brisbane.
" 29	Dublin—Subway	Urban District Council	S. Hart, City Engineer, City Hall, Dublin.
" 29	Stratton St. Margaret, Wilts—Electric Lighting	Urban District Council	G. K. Peers, Engineer, Prince's Chhrs., John Dalton St., Manchester.
" 31	Ramsgate, Yorks—Widening Railway	Urban District Council	W. J. Oudworth, Company's Engineer, York.
" 31	Madgate—Sea-Defence Works	Urban District Council	T. O. Taylor, Borough Surveyor, Albion House, Ramsgate.
" 31	London, S.W.—Self-propelled Lorry	Urban District Council	Director of Army Contracts, War Office, Pall Mall, S.W.
" 31	Pontypridd—Electric Cables, &c.	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
" 31	Hapton, Lancs—Electric Lighting	Urban District Council	K. O'Shaghnessy, 66 Hammo Terrace, Padiham.
" 31	Vigo, Spain—Water supply	Urban District Council	Commercial Intelligence Branch, Board of Trade, 50 Parliament St.
Aug. 1	Oroton to Shefton, Yorks—Construction of Railway	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
" 9	Clown, Chesterfield—Sewer	Rural District Council	E. Hazledine-Barber, Engineer, Hollih Hill, Clown.
" 21	Selangor, Malay States—Electrical Plant and Materials	Crown Agents for Colonies	Crown Agents for the Colonies, Downing Street, S.W.
" 23	Malvern—Electricity Supply Works	Urban District Council	H. P. Maybury, Engineer, Council House, Malvern.

COMPLETE LIST OF CONTRACTS OPEN—continued

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING—cont.:			
Sept. 1	Valparaiso, Chile—Electric Tramways	—	Chilian Consulate, 10 Lime Street, E.C.
14	St. Petersburg, Russia—2 Bridges over River Neva ..	—	The Delegation Municipale, St. Petersburg.
15	Lanncoston, Tasmania—Electric Power Transmission Extensions.	Mayor and Aldermen	J. Terry & Co., 7 Great Winchester Street, E.C.
15	Cairo—Widening Canal	Ministry of Public Works	Inspector of Irrigation, Projects Circle, Minia.
30	Port Adelaide, South Australia—Harbour	—	Agent-General for South Australia, 1 Crosby Square, London.
IRON AND STEEL:			
July 17	Leeds—Castings	Sewerage Committee	City Engineer, Leeds.
17	Cardiff—Cast-iron Pipes	Corporation	O. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
19	Wigan—Wrought-iron Fittings, Iron Castings, &c. ..	Water Committee	T. L. Hughes, Manager, Waterworks Depart., Chapel Lane, Wigan.
21	Addlestone, (Hertsey)—Cast-iron Pipes, &c. ..	Urban District Council	W. H. Radford, Albion Chambers, King Street, Nottingham.
23	London, E.C.—Deck Bridges, Pig Iron, Tools, &c. ..	East Indian Railway Co.	C. W. Young, Secretary, Nicholas Lane, E.C.
31	London, E.C.—Ironmongery, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
31	Dewsbury—Cast-iron Pipes, &c.	Lighting and Water Committee	C. A. Craven, Gasworks, Savile Town, Dewsbury.
Sept. 1	London, S.W.—Rails and Fishplates	—	Agent-General for Victoria, 15 Victoria Street, S.W.
No date.	Johannesburg—Manhole Covers, Columns, Joists, &c..	Municipality	E. W. Carling & Co., St. Dunstan's Bldgs., St. Dunstan's Hill, E.C.
PAINTING AND PLUMBING:			
July 17	Cardiff—Painting and Colouring School	—	D. Shepherd, 1 Frederick Street, Cardiff.
18	Chartham Downs, near Canterbury—Repairs, Painting	Kent County Lunatic Asylum	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
18	Colchester—Cleaning and Painting at Schools ..	School Board	C. E. Denton, Clerk, Board's Offices Colchester.
19	Wigan—Lead Pipe, &c.	Water Committee	T. L. Hughes, Manager, Waterworks Depart., Chapel Lane, Wigan.
19	London, S.W.—Painting and Cleaning Work	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
21	Barrow-in-Furness, Cleaning—Painting, &c. ..	Corporation	Borough Engineer, Barrow-in-Furness.
21	Pontypool—Painting Market	Urban District Council	Surveyor, Town Hall, Pontypool.
21	Lincoln—Painting	Corporation	R. A. Macbrair, City Surveyor, Corporation Offices, Lincoln.
21	Darlington—Painting, &c., at Schools	School Board	F. R. Steavenson, Clerk, Houndgate, Darlington.
23	Bury, Lancs—Painting Gas Offices, &c.	Gas Committee	A. W. Bradley, Borough Engineer, Bury.
23	London, N.W.—Painting and Cleaning Workhouse ..	St. John's Parish Guardians	H. W. Preston, Clerk, Workhouse, Hampstead, N.W.
23	Sutton, Surrey—Cleaning and Painting at School ..	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
24	Rotherham—Reglazing Roof and Leadwork	Corporation	J. Platt, Architect, High Street, Rotherham.
25	Nantyglo—Reroofing, Colouring and Cleaning Church	—	Vicar, Trinity Vicarage, Brynmawr.
26	Alltwen, Pontardawe—Painting and Colouring Chapel	—	J. Hinkin, Secretary, Dyffryn Road, Alltwen, Pontardawe.
31	London, E.C.—Plumber and Gas Fitter's Stores, &c..	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
ROADS AND CARTAGE:			
July 17	Harwich—Road Works	Town Council	H. Ditcham, Borough Surveyor, Harwich.
18	London, S.W.—Gravel	London County Council	Parks Department, 11 Regent Street, S.W.
22	London, N.W.—Roadmaking and Paving Works ..	Willesden District Council	O. O. Robson, Public Offices, Dyne Road, Kilburn, N.W.
22	Bettws, Wales—Levelling, Kerbing, Channelling, Asphalting, &c., Playground.	School Board	D. Edwards, Clerk, Capel Bach, Llangoynod, near Bridgend.
22	Prestwich, Lancs—Laying-out Land	Urban District Council	Surveyor, Chester Bank, Prestwich.
22	Dover—Street Improvements	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
23	Aldershot—Making-up, &c.	Urban District Council	Surveyor, Council Offices, Aldershot.
24	Market Harborough—Paving and Roadmaking Works	Urban District Council	Coales & Johnson, Bank Chambers, Market Harborough.
24	New Barnet—Making-up	Urban District Council	H. York, Surveyor, Station Road, New Barnet.
25	Little Sutton, Cheshire—Lane Construction	Wirral Rural District Council	T. Davies, 31 Kingsland Road, Birkenhead.
25	Lewes—Materials for Paving	Town Council	Borough Surveyor, Town Hall, Lewes.
26	Tredegar, Mon.—Limestone	Bedwelty Urban District Council	J. H. Lewis, Surveyor, Pengam, via Cardiff.
28	Barnet—Broken Granite, Gravel and Hoggins ..	Urban District Council	H. W. Poole, Clerk, Barnet.
31	Wanstead, Essex—Paving	Urban District Council	O. H. Brassey, Surveyor, Council Offices, Wanstead.
Aug. 2	Littlehampton—Steam Rolling	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
6	Littlehampton—Flints	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
9	Epsom—Making-up	Urban District Council	T. E. Ware, Surveyor, Waterloo Road, Epsom.
7	Wanstead, Essex—Granite Edge Kerb	Urban District Council	O. H. Brassey, Surveyor, Council Offices, Wanstead, N.E.
SANITARY:			
July 17	Leeds—Earthenware Pipes, &c.	Sewerage Committee	City Engineer, Leeds.
17	Leeds—Lime	Sewerage Committee	City Engineer, Leeds.
18	Thrupp, near Stroud—Sewers	Stroud Rural District Council	O. S. Cole, Resident Engineer, Bridge House, Ebley, Stroud.
19	Manchester—Urinal Stalls	Sanitary Committee	City Surveyor, Town Hall, Manchester.
19	Rotherham—Sewerage Works	Rural District Council	J. Platts, Engineer, High Street, Rotherham.
21	Southborough, Kent—Outfall Sewer, &c.	Urban District Council	W. Harmer, 137 London Road, Southborough.
21	Chertsey—Sewerage Works (Two Contracts)	Urban District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster.
21	Chertsey—Sewerage & Sewage-Disposal Works ..	Urban District Council	W. H. Radford, Engineer, Albion Chambers, King St., Nottingham.
21	Darfield, Yorks—Sewerage Works	Urban District Council	Fairbank & Son, 13 Lendal, York.
21	Bournemouth—Sewers	Town Council	F. W. Lacey, Borough Engineer, Bournemouth.
23	Canterbury—Drainage, &c.	—	J. Plummer, 38 St. Margaret's Street, Canterbury.
23	Sutton, Surrey—Sanitary Works at School	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.

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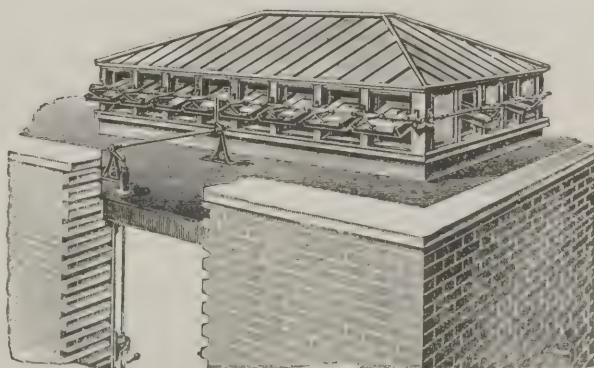
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THE "VICTOR" SILENT DOOR SPRINGS
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FANLIGHT OPENERS. New Patterns.

PANIC-EGRESS BOLTS. Approved by the L.C.C.

COMPLETE LIST OF CONTRACTS OPEN—continued

DATE OF DELIVERY	WORK TO BE EXECUTED	FOR WHOM	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
SANITARY—continued.			
July 28	Goole—Sewerage	Urban District Council	Sanitary Inspector, Council Offices, Goole.
" 29	Llanelli, Breconshire—Sewer	Brynmawr Urban District Council	D. W. Slocombe, Surveyor, Market Chambers, Brynmawr.
Aug. 9	Clown, Chesterfield—Sewer	Rural District Council	M. Hazledine-Barber, Engineer, Hollis Hill, Clown.
No date.	Johannesburg—Glazed Earthenware Pipes	Municipality	E. W. Carling & Co. St. Dunstan's Bldgs., St. Dunstan's Hill, E.C.

COMPETITIONS OPEN.

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July 19	Aylesbury—Monument	—	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
" 26	Clacton-on-Sea—Board School	—	C. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Nava River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	O. H. J. Talmage, Southchurch Road, Warner Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk Liverpool.
" 16	London, S.E.—Artizans' Dwellings	£100, £60, £40.	F. Ryall, Town Clerk, Bermondsey Town Hall, Spa Road, S.E.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.C. Offices, Tottenham.
" 29	Bideford—Municipal Offices and Public Library	£30, £15, £10.	W. E. Seldon, Town Clerk, 18 The Quay, Bideford.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.
No date.	Montreal, Canada—War Monument to Canadian Soldiers	—	Bank of Montreal, 22 Abchurch Lane, E.C.

Trade and Craft.

Geysers.

Geysers are undoubtedly a great convenience in many cases, as the cost of installation is slight and they need only to be lighted when water is purposely wanted; so that there is no waste. The geyser made by Maughan's Patent Geyser Co., Ltd., 6, Holywell Row, Finsbury, London, E.C., was introduced about thirty years ago, and has been largely adopted. It has no tubes, chambers or other confined places, causes no smell, and can be supplied from the main or cistern through fittings of any pattern. It has a patent valve for automatically shutting off gas when water is turned off or the supply fails, and has no india-rubber, leather or other perishable parts. No. 4 size heats $4\frac{1}{2}$ gals. per minute (40 degs) or a hot bath of 30 gals. in five to ten minutes. These geysers may also be obtained with oil burners for use where gas is not available. The "Holywell" geyser is a cheap form of the "Maughan." Another specialty is the

"Teba" auto-geyser, which is perfectly automatic in action, so that the opening of any tap on the hot-water pipe sets the geyser in action: when no hot water is being drawn the gas is reduced to a small flame. There have latterly been some questions raised as to the healthiness of geysers. In the majority of cases the defects have been due to the absence of a proper ventilating flue to carry off the products of combustion. If such a flue is fitted there should be no cause for complaint.

Gas Stoves and Ranges.

During recent years the use of gas for cooking purposes has been very largely extended, by reason of the advantages it possesses over ordinary fires. There are many makers of gas stoves and ranges, but so far as Senking's patents are concerned it is sufficient to note that they have been used in many of the leading hotels and clubs in London and that the firm has for many years designed and supplied all the cooking apparatus for the various establishments of his Majesty the Emperor of Germany. The "Economy"

and other stoves, which can be inspected at the showroom at 15, Queen Square, Bristol, are all made of wrought-iron, with cast-iron top-plate, japanned or enamelled body, and nickel-plated railing and taps, the last being circular and having a pilot-light arrangement. All kinds of cooking apparatus are supplied by the firm.

A New Electric Clock.

Sir William H. Bailey, an ex-mayor of Salford, has invented an electric clock with a peculiar dial intended to celebrate the Coronation. In place of figures this dial has the letters "King Edward VII." arranged around it, the "K" occupying the place of the hour VIII., so that with a crown on the XII. dividing the words "King" and "Edward" the VII. comes in its usual place. The dial is 6ft. in diameter. Each letter is on a convex lens, with an electric lamp behind. The arrangement is also patented for application to steam, water-pressure and other gauges, speed indicators, &c. One of the clocks has been fixed outside the Salford Town Hall and another at the office of the firm—Albion Works, Salford.

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The Best Geyser for Ordinary Bath use **Established 30 Years**

The "TEBA" AUTO-GEYSER

supplies Hot Water to all parts of the House

As Fitted in Windsor Castle

A COMPLETE SUBSTITUTE FOR THE "CIRCULATION" SYSTEM:

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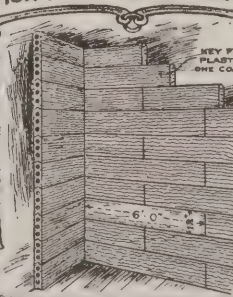
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BLAMING THE TEXT-BOOKS.

Some interesting expert evidence was given at the resumed trial in Edinburgh yesterday of Alexander McDougall, contractor, on a charge of culpable and reckless neglect of his duty in erecting the terracing at Ibrox Park which collapsed at the international football match last April with such lamentable results.

The surveyor who examined the plans said his approval was given on the understanding that the joists were to be of red pine. After the disaster he found that the wood was of an inferior quality of yellow pine, and very brittle.

For the defence Sir Benjamin Baker, the designer of the Forth Bridge, described the stand as much too light for the weight it bore, and said it was a case of the Tay Bridge over again. The trouble had arisen from text books which were out of date. In some cases they were absolutely and cruelly misleading.

Sir William Arrol, the contractor for the Forth Bridge, agreed.—Extract from *Daily Mail*, July 9, 1902.

The above evidence clearly demonstrates the necessity of consulting only a reliable and thoroughly up-to-date authority.

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IS THE STANDARD AUTHORITY

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The 1903 Edition of “SPECIFICATION” now preparing for press will be entirely rewritten and carefully revised by experts in every branch of the Trade.

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Advertisements will be placed, as far as possible, in the Trade Section, and opposite the particular matter to which they relate.

TECHNICAL
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CURRENT MARKET PRICES.

FORAGE.			
	£ s. d.	£ s. d.	
Beans per qr.	1 15 0	2 0 0	
Clover, best per load	4 15 0	6 10 0	
Hay, best do.	5 5 0	5 12 6	
Sainfoin mixture do.	4 10 0	5 5 0	
Straw do.	1 10 0	2 4 0	

OILS AND PAINTS.			
	£ s. d.	£ s. d.	
Castor Oil, French .. per cwt.	1 5 1	1 6 0	
Colza Oil, English .. do.	1 6 6	—	
Coppers per ton	2 0 0	—	
Lard Oil per cwt.	2 13 0	2 14 0	
Lead, white, ground, carbonate do.	1 4 10	—	
Do. red do.	1 0 4½	—	
Linseed Oil, barrels .. do.	1 10 3	—	
Petroleum, American .. per gal.	0 0 6½	0 0 6½	
Do. Russian do.	0 0 5½	0 0 5½	
Pitch per barrel	0 7 0	—	
Shellac, orange per cwt.	5 6 0	5 0 7	
Soda, crystals per ton	3 2 6	3 5 7	
Tallow, Home Melt .. per cwt.	1 10 0	1 10 6	
Tar, Stockholm per barrel	1 2 6	—	
Turpentine per cwt.	1 13 6	1 13 7½	

METALS.			
	£ s. d.	£ s. d.	
Copper, sheet, strong .. per ton	69 0 0	—	
Iron, Staffs, bar do.	6 15 0	8 10 0	
Do. Galvanised Corrugated sheet .. do.	11 10 0	12 0 0	
Lead, pig, Soft Foreign .. do.	11 7 6	—	
Do. do. English common brands do.	11 12 6	—	
Do. sheet, English 3lb per sq. ft. and upwards .. do.	13 5 0	—	
Do. pipe do.	13 15 0	—	
Nails, cut, 3in. to 6in. .. do.	9 5 0	—	
Do. floor brads do.	9 0 0	—	
Steel, Staffs, Girders and Angles do.	5 15 0	6 5 0	
Do. do. Mild bars do.	6 10 0	7 0 0	
Tin, Foreign do.	127 10 0	128 0 0	
Do. English ingots do.	128 8 8	128 10 0	
Zinc, sheets, Silesian .. do.	22 7 6	—	
Do. do. Vieille Montaigne .. do.	24 10 0	—	
Do. Spelter do.	19 2 6	19 7 6	

TIMBER.			
SOFT WOODS.			
	£ s. d.	£ s. d.	
Fir, Dantzic and Memel .. per load	3 0 0	4 10 0	
Pine, Quebec, Yellow .. per load	4 7 6	6 0 0	
Do. Pitch do.	2 14 0	3 1 0	
Laths, log, Dantzic .. per fath.	4 10 0	5 10 0	
Do. Petersburg .. per bundle	0 8	—	
Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0	
Do. do. 4th & 3rd .. do.	8 10 0	15 15 0	
Do. do. unsorted .. do.	5 12 6	6 10 0	
Do. Riga do.	6 15 0	12 10 0	

	£ s. d.	£ s. d.
Deal, Petersburg 1st Yellow do.	16 5 0	—
Do. do. 2nd .. do.	9 0 0	12 10 0
Do. do. White .. do.	7 5 0	12 10 0
Do. Swedish do.	8 15 0	16 15 0
Do. White Sea do.	13 5 0	17 5 0
Do. Quebec Pine, 1st .. do.	18 10 0	22 5 0
Do. do. 2nd .. do.	22 5 0	—
Do. do. 3rd & 4th .. do.	9 5 0	—
Do. Canadian Spruce, 1st .. do.	7 10 0	12 10 0
Do. do. 3rd & 2nd .. do.	9 0 0	9 10 0
Do. New Brunswick .. do.	7 6 0	8 0 0
Battens, all kinds .. do.	7 12 6	10 5 0

COMING EVENTS.

Wednesday, July 16.

BUILDERS' FOREMEN'S AND CLERKS OF WORKS' INSTITUTION.—Half-yearly Meeting of Members, at 8 p.m.

Saturday, July 19.

ARCHITECTURAL ASSOCIATION.—Members begin to assemble at the "Red Lion" Hotel, Banbury, the headquarters, for the Summer Excursion.—Camera and Cycling Club visit Brewers' Hall, E.C., at 3 p.m. SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—A Morning Meeting and Summer Excursion.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—Excursion to Truro by invitation of Mr. Silvanus Trevail, F.R.I.R.A., Pres. S.A. Members will be met at the railway station at half-past nine, and after visiting the new Viaduct, the Waterfall and Victoria Gardens, New Cattle Market, Kenwyn Church Museum, Technical Schools, Free Library, Wesleyan Chapel and other places, will lunch at Mr. Trevail's residence. The afternoon will be devoted to a trip by river to Falmouth and a drive through the town, the party returning to Truro by steamer in the evening.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS (Newcastle-upon-Tyne).—Council Meeting at 1.30.

Friday, July 25

CONFERENCE IN CONNEXION WITH THE NATIVE STUDY EXHIBITION at the Royal Botanic Gardens, Regent's Park, W. Prof. Lloyd Morgan on "Native Study in Elementary Schools." Lord Strathcona presides.

Saturday, July 26.

ARCHITECTURAL ASSOCIATION.—Fourth Summer Visit to view Church and Monastery of St. Francis, at Bocking Bridge, Essex, by the late Mr. J. F. Bentley. Members to meet at the main line booking office, Liverpool Street, at 11.45 a.m. for the 12 o'clock train. Camera and Cycling Club visit with the ordinary Summer visit.

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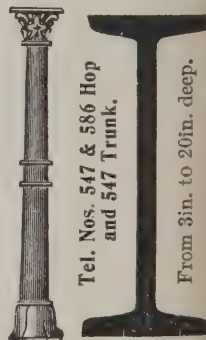
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An Architectural Causerie.

The Campanile. THE official enquiry into the cause of the collapse of St. Mark's Campanile at Venice is now being held. Many causes have been suggested. First, the foundations were said to be faulty, but judging by Mr. Blackall's report of four years ago there seems to be no valid reason for such an assertion: indeed, it will probably be found that the piles are as sound as ever. The Venetians believed that the foundations were as deep as the campanile was high, spreading like a great pyramid under the piazza, but Signor Boni's investigations soon disposed of that fallacy: for, 16ft. below the pavement level, he found a *zatterone* or large timber raft resting on 10in. piles, these latter being topped with masonry, on which the brick structure stood. But this raft was only 1ft. more all round than the campanile's base, and Signor Boni pointed out that the tower was quite one-third too high. Earthquakes have been mentioned as the cause of the collapse. Professor Belar is chiefly responsible for this, and though an eminent worker in a similar branch of science, Professor Suess, ridicules the idea, there certainly may be a certain amount of truth in it. Yet another cause suggested is the dredging of the canal close by and the subsequent movement of the foundations. This is quite feasible, though there is little proof to support the assertion. Another suggestion is that the collapse was due to the fissures made by lightning in past centuries and the excessive weight of the Renaissance belfry, which eventually crushed the whole. Still another suggestion is that the cannon fired at nine o'clock every evening on the Island of San Giorgio opposite may have set up vibrations that gradually weakened the structure: while other persons assert that the ringing of the great bells was the cause. Finally we have the collapse ascribed to the cutting of a fireplace and chimney for the custodian, and the cutting of a trench 1ft. deep right across the east wall to remove some weathered stones. Possibly it may never be determined what was the real cause: probably it was a combination of many, though we are ourselves inclined to think that the theory of the fissures made by lightning and increased by the cuttings above referred to is as true as any. The Venetians certainly seem determined to have another campanile on the piazza, a duplicate of that now fallen, and many portions of the sculptures and bronzes will, it is said, be embodied in the new construction: a proposal which finds a ready support among artists in this country. There are, in fact, two sides: the one, that of the artist, who thinks of St. Mark's and its surroundings only

as a beautiful picture with the campanile as an essential feature, a place which he has loved and long been familiar with, so that for him there *must* be another campanile, though it be a servile imitation: while the other side, that of the architect proper, considers that there is no necessity for another campanile at all, that it would indeed have no logical reason, but that if one *is* to be erected it shall be a fresh design entirely. Those are the views of the two parties, and we certainly agree with the latter. Meanwhile Signor Boni is carefully supervising the removal of the debris. At the same time we hear of other famous structures which are said to be in danger—the cathedral and the town hall at Vicenza, by Palladio; the church of St. John Lateran in Rome, the roof of which threatens to fall in; and the church of St.

by the Hotel Cecil, and on the west by York Buildings. They suggest that the development could be confined to that portion of the site lying between the Embankment Gardens and John Street, and would probably necessitate (1) the widening of John Street from 38ft. to 50ft., and (2) the widening of the street known as York Buildings from about 28ft. to 55ft., in both cases the setting back being on the side of the road next to the buildings; (3) the closing of part of Adam Street; (4) the closing of Adelphi Terrace; and (5) the closing of Robert Street. Thus it seems that all the Adam work would be demolished. This is much to be regretted, especially as such a splendid site was available on the "island" at the foot of the new street from Holborn to the Strand—a far finer site in our opinion.



ST. MARK'S VENICE, AND ITS CAMPANILE.

Francis of Assisi, at Assisi, which is said to be so dilapidated that the rain has come in and ruined some of the pictures. Doubtless in Italy just now a certain amount of panic prevails in regard to these matters, but there is certainly cause for anxiety in some cases. One can hardly be expected to agree, however, with Professor Wagner's gloomy view that the whole of Venice is doomed to destruction—except so far as everything human is doomed eventually.

London's County Hall.

AFTER considering many sites during the last two years, the Special Committee appointed by the London County Council to suggest a suitable site for the proposed new County Hall have presented their report; and they recommend a site of 3.35 acres in the Adelphi, bounded on the north by William Street, the Tivoli Music Hall and Adam Street, on the south by the Embankment Gardens, on the east

The Defacement of Buildings. A CRUSADE has been started at Dundee against persons who deface buildings by striking matches on the walls. Such defacement is naturally a cause of great annoyance to owners and architects, and while every power under the law should be stringently exercised, the fact that such annoyance is likely to be continued should ensure the adoption, wherever possible, of some surface on which writing is impossible. For instance, in public lavatories it will be found most desirable to use glazed tiles or bricks for the walls. There is also the defacement of buildings caused, not by mere wantonness or thoughtlessness, but by the very nature of things. This is especially the case with theatres, concert halls, and similar places of entertainment, where the waiting crowds lean and rub against the lower part of the walls, dirtying and defacing them; and the same soiling occurs on the inside walls of churches at the ends of pews.

ST. MARK'S CAMPANILE.

HOW AND WHY IT FELL.

IN our last issue we were able to briefly announce that the detached Campanile of St. Mark, Venice, had fallen and lay a heap of ruins on the Piazza. The following is a full account of the catastrophe:—

The Campanile fell at 9.53 on Monday morning, July 14th. A crowd of people had gathered on the Piazza about half-past nine, and were gazing at the crack which had appeared in the Campanile, and which had become more evident during the night. The crack started at the north-east corner at the top of the Loggia Sansovino, went diagonally across the main corner buttress of the tower, and then perpendicularly for about 8ft. A few moments before the disaster some dust came from the crack, and then suddenly one of the columns of the bell chamber at the top fell, followed by the angel at the summit, and in another moment the whole stone top of the Campanile came crashing to the ground, crushing the Loggia Sansovino and two arches of the residence of the Procuratie and damaging the library of the Royal Palace. There was a pause, and then the whole edifice sank gently to the ground.

That portion of the tower which was nearest to the Palazzo Reale, and which had been rendered more solid by the recent pointing of the bricks, fell in greater masses, and, striking the corner of the library, destroyed about 6yds. of the frontage, leaving the gallery within open to view. If the whole tower had been re-pointed, it would probably have fallen in a more solid mass, and would have destroyed the church and the other buildings around. As it is, not a stone of St. Mark's or the Doges' Palace is injured.

On Sunday, July 13th, the day before the catastrophe, the prefect of Venice informed Signor Nasi, Minister of Public Instruction, of the dangerous crack which had formed on the side of the Campanile and of the precautionary measures taken in consequence. Signor Nasi ordered the architect Signor Boito and Signor Calderini, the Director-General of Antiquities at the Ministry of Public Instruction, to leave immediately for Venice, giving them the fullest powers to take any steps they considered urgent. The minister had received no previous warning that there was a danger of the fall of the belfry; on the contrary, the Technical Committee had decided in November last that there was no danger.

On Friday some old cracks were noticed to have widened, and the local Committee for

the Preservation of Monuments, which includes among its members several architects and artists, at once held a meeting. A careful examination was made of the fissures, which on Saturday had considerably enlarged, and it was agreed that the Tower was in a perilous state, although the danger was not immediate.

Orders were at once issued to stop the ringing of the bells, and the Committee met again on the Piazza at six o'clock on Monday morning. The cracks were then seen to have extended, and the work of protecting the tower was begun without delay. The Piazza was cleared, the shops closed, and the Royal Palace was abandoned by all the inmates. Thanks to these precautions the subsequent disaster was not attended by loss of life.

The fall was a matter of two or three seconds, and was accompanied by a noise like thunder.

Some defects had been noticed in the structure in 1898, but the expert report was reassuring. In 1885, Signor Boni, who is at present conducting the excavations in the Forum at Rome, reported that the foundations had originally been laid, to all appearances, for a tower of less height than the one actually built on them.

Professor Wagner's Opinion.

The eminent Vienna architect, Herr Otto Wagner, Professor at the Academy of Fine Arts, and one of the first experts in construction and building in Austria, was asked by the "Fremdenblatt" for his opinion about the disaster, and in reply made an elaborate statement of most alarming character. He said: "In my opinion, the whole of Venice is doomed to destruction. The foundation on which the city is built has deteriorated; the piles are becoming rotten and decayed, and can no longer support the immense weight above. The oscillations and sinking, which have been remarked for many years, have had their effect on the buildings, and have necessitated continual repairs and restorations. Thus the Doges' Palace was only a few years ago thoroughly restored, and whenever I have been to Venice during the last thirty years I have seen architects and masons busy at their work."

That the expert commissions which had been officially entrusted with the examination of the condition of the Campanile did not notice the danger of its collapse, Professor Wagner attributes to the fact that the Italian architects, though they stand in the first rank in all that concerns the design of façades and decoration, do not stand equally high in construction and foundation work. It must not be forgotten, however, that the examination of sub-structures presents the greatest difficulty in Venice.

Asked for his views as to what should be

done, the Professor said that the débris of the Loggetta should be collected as carefully as possible. Not a fragment of it should be lost, and then, perhaps, it would be feasible to reconstruct a part of this magnificent building out of the pieces. The tower itself should not be rebuilt, as it is no longer a necessity for the town, as it used to be when it served as watch tower, and its historical and artistic value cannot, after all, be restored. If it should be rebuilt, as seems to have been resolved upon in Venice, it should be done in the modern style as a new tower. Otherwise it would be a falsification of the history of architecture.

The Earthquake Theory.

Professor Belar, the Director of the Seismographic Observatory of Laibach, says that the recent earthquakes, which worked such havoc in the neighbourhood of Salonica, must have shaken the Campanile for a whole hour, and may have completed the work of destruction which the lapse of time, the nature of the foundations, and the earthquakes so common in North Italy had been preparing for centuries. At Easter, Professor Belar says he noticed a marked inclination of the Campanile.

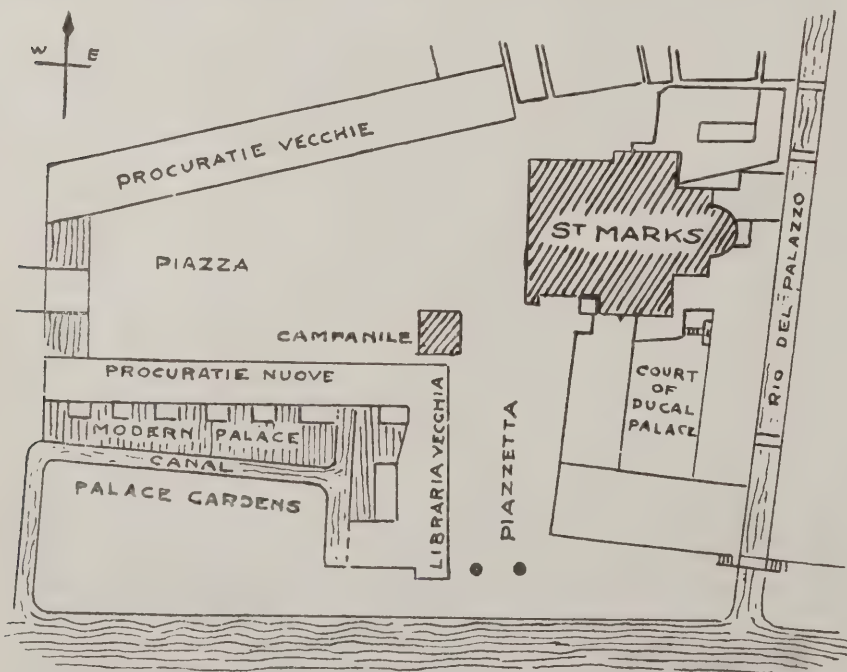
Professor Eduard Suess, President of the Vienna Academy of Sciences, and a recognised authority on geology, of European reputation, in an interview with the representative of the "Neues Wiener Tagblatt," expressed the opinion that no slipping or sinking of the soil was responsible for the collapse of the Campanile, and that the earthquakes, in particular, had nothing to do with it. The most recent earthquakes felt in Venice, such as those at Salonica and in Dalmatia, must have been too weak, when they reached the city, to have affected the tower. The Professor's view is that the building itself had become defective through the lapse of time, and that Venice is doomed is true only in the sense that every work of man is destined to destruction sooner or later.

Another authority states that the collapse of the Campanile was not caused by any subsidence of the foundations, but through its having split at a point half-way up, where it was struck by lightning in the year 1745.

It is also suggested that the constant dredging of the entrance of the Grand Canal and the Giudecca, in order to enable larger ships to visit the port, has caused a slipping of the earth, and that the Campanile, being the heaviest of all the Venetian buildings, is only the first to suffer.

Mr. Blackall's Inspection of the Foundations.

A critical examination of the foundations of the Campanile (the weight of which was 22,000 tons) was made in 1885 by an American architect, Mr. C. H. Blackall. The foundations rested on a raft, composed of a double layer of logs, one row laid crosswise on the other. This timber was found to be in good preservation and not to have rotted. Below this was the piling proper. The piling directly under the foundations was surrounded by an exterior fencing of piles, at the same level, wholly separate from the foundations, and bearing no weight whatever. By comparing the height of these exterior piles with those supporting the Campanile, as well as by examining the foundations proper, it was proved that "the foundations have stood the test for centuries without yielding an inch"; and Vasari, writing in the sixteenth century, says in his life of Arnolfo di Lapo that the Campanile "has never sunk, even by a hair's breadth," owing to the able construction of its foundations. They were laid in a soil consisting of a stratum of the heavy black clay which underlies Venice to a depth ranging from a few inches to a hundred feet; and the secret of the piling done by the Venetian builders was that they did not carry it through to the sand, but confined it to the clay, which, in this instance, was not only compacted and strengthened by such piling, but was bound round the foundations by an additional external fence. The foundations of the Campanile were laid at the same time as those of the church, and to judge from all accounts they were as well and truly laid as any foundations of piles in a lagoon can be. After the digging had been carried down to the stiff clay the piles of white poplar were driven in over the whole area of the tower, and over these was constructed a level platform of oak trees. Above these rose five courses of trachyte and other granite or porphyritic rock in huge masses, and these again



PLAN OF ST. MARK'S, VENICE: SHOWING THE POSITION OF THE CAMPANILE IN ITS RELATION TO THE SURROUNDING BUILDINGS.



[Photo: Alinari, Venice.]

THE RUINS OF ST. MARK'S CAMPANILE, VENICE, SHOWING THE DAMAGE DONE TO THE SANSOVINO LIBRARY.



THE RUINS OF ST. MARK'S CAMPANILE, VENICE: FROM THE PIAZZA.

[Photo: Alinari, Venice.]

were surmounted by six courses of similar stone in step-like offsets forming a plinth to the tower.

The New Tower.

On July 14th the Syndic, referring to the grant of half a million francs for the reconstruction of the Campanile, said that the new tower would not be a monument of their past greatness, but of their gratitude for past glory and remembrance of their affliction.

The Municipal Council of Venice has voted a first credit of half a million francs for the reconstruction of the Campanile and the Loggetta of Sansovino. The Savings Bank has also given a hundred thousand francs towards the same object.

The Municipal Council of Rome has decided to contribute twenty thousand francs towards the fund for the restoration of the Campanile. The example will be followed by other towns. Senator Breda, of Padua, has offered 100,000 lire and His Holiness the Pope has also promised a contribution.

It is calculated that the cost of reconstructing the Campanile will amount to ninety-four million francs.

After the sitting of the Municipal Council on Monday, July 14th, a demonstration of sympathy was made before the architect Vendrasco's house, he having been sent away to Sardinia for having publicly insisted upon the threatening state of the Campanile.

A Copy or a Fresh Design?

The "Daily Graphic" said: "The twentieth century is not likely to build up from the ground the great tower that the tenth century planned and the twelfth completed, and the only prayer of all lovers of Venice will be that the task may not even be attempted. Better the loss of the Campanile for ever than its replacement by some modern atrocity."

"But why 'modern atrocity'?" asks a correspondent. "As one very familiar with the monument in question, I am anxious for its

reconstruction with absolutely precise repetition not only of its exact proportions, but its detail, and largely of its veritable materials. By such resurrection of a monument far finer—pace Mr. Ruskin—than Giotto's tower at Florence, future generations may enjoy, not a mutilated Venice, robbed of its most prominent feature, but the Venice which has afforded rapturous pleasure in the past and the present. Many years ago a madman smashed to fragments one of the supremest works of Greek art—the Barberini (or Portland) vase of the British Museum. In its place now we have not a 'modern atrocity,' but the veritable vase itself, preserved to us and future generations by a process of admirable reconstruction. The like process was employed by the late Mr. Pearson on the west front of Peterborough Cathedral. A super-sentimental clamour arose against the work, which, it was alleged, would destroy the old work and the interest therein. It did nothing of the kind. We have still with us the Peterborough front, and not a 'modern atrocity.' In like manner the Campanile of St. Mark may rise again in majesty to glorify Venice for another thousand years, and afford delight to multitudes of visitors unborn."

Among the Débris.

The bronze gates of the Loggetta Sansovino have been found under the débris twisted and with one of the lions broken. Hopes are entertained that it may be possible to save the pictures of Tintoretto and Lo Schiavone, which are hidden in the only standing portion of the Loggetta. So far there is no apprehension of other buildings being damaged except in the case of one corner of the Royal Palace, which is to be strongly propped up before the débris is removed. The golden angel, which was on the top of the belfry, has been deposited in the Cathedral of San Marco (this figure is of gilded bronze with a wood core, and is about 20ft. high).

Researches are being made in the Galleria Degli Uffizi at Florence, in which have been preserved several cartoons of the destroyed Portico of Sansovino, in order, if possible, to find the original plan of the Loggetta at Venice.

What Might have Happened.

The "Daily Chronicle" says:—A great slaughter would have been caused if the collapse had taken place in the evening, when the band was playing; for no citizens stroll out in such numbers as do the gentle Venetians, going to hear Wagner on the floor of that majestic drawing-room, their piazza.

Condition of the Doges' Palace.

The "Giornale d'Italia" states, respecting the disaster, that when, some years ago, the "Corriere della Sera" published a paragraph about the dangerous condition of the Doges' Palace, Dr. Baccelli replied that the Venetian Giunta delle Belle Arti, at Rome, had almost exceeded their powers in calling attention to the matter, but that such a clamour was made that some repairs were carried out. Signor Boito, the architect, was meanwhile sent from Milan to Venice to see the district architectural committee, and he drew up a report absolving all parties concerned from blame. The architectural committee thereupon continued to remain in office. The catastrophe, however, is regarded as a condemnation of its members.

The History of the Campanile.

During the early years of Venetian history the site of the present church and square of St. Mark was a large grassy field with rows of trees, divided by a canal (which no longer exists) and containing two churches. One of these stood on the site of the present church, and the other was a little to the north-west of the Campanile. The history of the Campanile itself is very obscure. It was begun, according to some, in 888, and according to others in 902; restored 1329, the marble top added 1417, and the

angel reared on the summit 1517. The tower was not raised as high as the belfry till the twelfth century.

About 1510 the architect-sculptor, Buono, is credited with the reconstruction of the belfry and the addition of the pyramidal top. Restorations were undertaken from time to time, especially in 1805, but the general character of the tower remained without change. The Campanile was 323ft. high and 42ft. wide at its base. The top was reached by a winding series of inclined planes, the easy gradients of which tempted thousands of visitors every season to go up and enjoy the magnificent view. The tower was of brown brick, resting on a stone base, and decorated with slight pilasters.

The "Times" says:—"Venice will never be quite the same again. 'Lean and bald' as the Campanile was pronounced by the great architectural authority, James Ferguson, and little as it seems to have interested Ruskin, so glorious a survival of the great age of Venice, so conspicuous a point in the landscape, and a building glorified by such a series of great painters from Gentile Bellini to Canaletto, from Guardi to Turner, belonged to the whole world, and the whole world will mourn its disappearance. It disappears after a life of exactly 1,000 years that is to say, it was in A.D. 902 that the Campanile was begun under the government of Domenico Tiepolo. Then it was that the young community which had migrated from the mainland to Rivo Alto and the islands less than a century before, determined to build a communal tower which should both hold the bells that were to give the signals for assemblies processions and dangers, and should rise up as a proud symbol of power and independence. It seems certain that, like most of the other great campanili of Italy, this one was primarily communal, not ecclesiastical. It has always borne the name of St Mark, but it was in no sense a part of the

basilica. . . . Its fall, whatever the proximate cause, seems to prove conclusively that the ground of Venice, even at its most solid point, such as the Piazza was supposed to be, is not firm enough to offer a safe foundation for a building of the enormous weight of the Campanile, concentrated upon so narrow a base. The very existence of Venice, its palaces built on piles driven into the mud of the lagoon, has been a standing marvel to architects for centuries. It would seem that nature has once more read man a lesson, and has asserted in this cruel way that to build on a shifting bottom a tower presumed to be eternal is to confide too much."

Pictures of the Campanile.

The Campanile has been sketched probably by every amateur or professional painter who has visited Venice. There is a picture of it in the present exhibition of the Old Water-Colour Society by Mr. Reginald Barratt (9), and that the Campanile was equally attractive to earlier painters is evident from the fact that in the Thirteenth Room of the National Gallery careful and exact paintings of the tower by Guardi and Canaletto respectively hang side by side.

The directors of the Fine Art Society have collected a number of water-colour studies of Venice by various artists, and in each picture some aspect of the lately-destroyed Campanile is shown. No formal invitations will be issued to this exhibition, which is about to be opened at the galleries of the Society in Bond Street.

Ruskin's Description.

Ruskin said of the Campanile—"It is built as simply as it well can be to answer its purpose. It has no buttresses, no external features whatever; one bold square mass of brickwork; double walls, with an ascending inclined plane between them, with apertures as small as possible, and these only in necessary places, giving just the light required for ascending the stair or slope, not a ray more; and the weight of the whole

relieved only by the double pilasters on the sides, sustaining small arches at the top of the mass, each decorated with the scallop or cockle shell. Then, when the necessary height is reached, the belfry is left open and the whole crowned by as much spire as the tower would carry to render it more serviceable as a landmark."

Ferguson's Criticism.

Ferguson says in his "History":—"One of the oldest and certainly the most celebrated of the Gothic towers of Italy is that of St. Mark's at Venice, commenced in the year 902; it took the infant republic three centuries to raise it 180ft. to the point at which the square basement terminates. On this there must originally have been an open loggia of some sort, no doubt with a conical roof. The present superstructure was added in the sixteenth century; but though the loggia is a very pleasing feature, it is overpowered by the solid mass that it surmounts and by the extremely ugly square extinguisher that crowns the whole. Its locality and its associations have earned for it a great deal of undue laudation, but in point of design no campanile in Italy deserves it less. The base is a mere unornamented mass of brickwork, slightly fluted, and pierced unsystematically with small windows to light the inclined plane within. There are no doubt important elements in that low class of architectural excellence of which the Egyptian pyramids are the type; but even in these elements this edifice must confess itself a pigmy, and inferior to even a second-class pyramid on the banks of the Nile, while it has none of the beauty of design and detail displayed by the Giralda of Seville, or even by other Italian towers in its own neighbourhood. The Campanile at Pienza is, perhaps, more like the original of St. Mark's than any other, and certainly displays as little beauty as any building of this sort can possess."



THE RUINS OF ST. MARK'S CAMPANILE, VENICE: FROM THE PIAZZETTA.

[Photo: Alinari, Venice.]

A Note by Street.

In his notes of tours in the north of Italy, the late Mr. G. E. Street on leaving St. Mark's says:—"We will go out by the baptistery, and here we are at once on the Piazzetta, the noble façade of the Ducal Palace on one side, and a great work of Sansovino's—the library of St. Mark—on the other; at the end of the Piazzetta are two monolithic granite columns, one of which bears the lion of St. Mark, the other the figure of the ancient patron saint of Venice, S. Theodore; between them is seen the dark blue line of the sea rippled into a thousand twinkling waves, and beyond this the Isola San Giorgio, remarkable for one of Palladio's churches—a building, as I think, irredeemably ugly, but, nevertheless, much admired by many."

The Committee of Enquiry.

The Press has been informed that Signor Nasi has concluded his investigations preliminary to the opening of the enquiry into the cause of the collapse of the Campanile. At a meeting of the members of the Committee of Enquiry and the authorities, Signor Nasi made known the steps which he had considered it necessary to take with a view to ensuring harmonious co-operation in the work to be undertaken and the adoption of the best means of clearing the square of St. Mark of the debris. He said that selection would be made from the ruins of all material which could be used again, and all indications which might enable the Committee of Enquiry to form a judgment would be carefully preserved. With this object he had entrusted the direction of the works to Signor Boni, the architect. Signor Boni would co-operate with the Committee of Enquiry, and if necessary would receive assistance from the Government and municipal engineers. The historical and artistic interests involved would be kept in view in this work, as well as the researches of the Committee of Enquiry.

The Committee has been ordered to examine the condition of the other monuments on the Piazza, when more efficacious measures will be taken in view of the protection of all the monuments of Venice.

Signor Nasi, Minister of Public Instruction, having received a report on the state of the foundations of the Basilica Palladiana at Vicenza, has ordered the municipal engineer of that city to go to Venice, and to bring with him reports and other documents relating to the basilica and the plans of the buildings, so that urgent measures may be taken for its preservation.

According to the "New York Herald" the immediate causes of the fall of the Campanile were the cutting of a fireplace and chimney inside to enable the custodian to have a fire, and the cutting of a trench along the east wall to remove the rain-beaten stones and put in zinc in their place. The trench was cut on Monday, July 7th, by Signor Rupolo, the official engineer, who perceived the danger, and gave the alarm, but nothing was done until the following Thursday. The only man who seemed to fully realise the danger was the architect Signor Vendrasco, who for the last twelve years has been urging the Government to repair the tower. Five weeks ago he was cashiered for again stating that the tower was in a bad state, and on the fatal Monday he said, "It will fall in a few hours."

In an interview the son of the dismissed architect said that his father on Sunday last pointed out the crack in the wall, remarking that a cut over 1 ft. deep had been made right across the east side. The Campanile had listed eastward. "It is doomed," said the father. "It is like an old oak tree—felled." Signor Rupolo, the Architect of Public Monuments, confesses that when he had finished the cut the Campanile listed and cracked. He inserted wooden staves and wedges, but without avail.

The recovery of the beautiful decoration of the Sansovino loggetta is proceeding under Signor Boni most satisfactorily. In addition to the bronze gates, which have been found intact, the whole front cornice with the columns and angels, also the three bas-reliefs in marble intact, and the beautiful bronze of Mercury, injured only in the hands, have been found.

Among the bricks of the Campanile are Roman bricks from Aquileia, the birthplace of

the Venetians, evidently brought here as relics of their old home. Portions of the tower are proved to have been hollow and filled with rubbish.

A thorough inspection of the other monuments in Venice is being made with more or less satisfactory results, and it is to be hoped that the very necessary repairs will be made, where they have been found to be required.

A Superstition.

A halo of superstition is gathering round the great event. In St. Mark's is a figure of the Madonna which has long been held to possess miraculous power. When the Campanile fell the angel is said to have flown to warn the Madonna, who straightway prevented the destruction of the church. To-day, to-morrow and Friday services of thanksgiving will be held in St. Mark's, and this Madonna, with the shattered angel, is to be placed on the high altar.

Some Most Important Facts.

The following observations are made by a correspondent in Venice (Mr. A. Robertson):—Though the walls of the Campanile were thick (nearly 6 ft.), they were really not solid. They consisted of two parallel walls of brick, the 3 ft. space between them being filled up with broken bricks, rubble, cement, stones, &c. The cement used was Istrian lime mixed with sea sand. This lime does not become hard, nor does it adhere well to the bricks. Indeed, in the course of the past centuries it became dry powder.

The Campanile had been damaged by lightning, fire and earthquake several times—by lightning in 1398, 1417, 1548, 1565, 1653, 1657 and 1745 (a conductor was erected in 1776); by fire (through the lighting of fires on the platform, and the consequent burning of the wood top) in 1401, 1403 and 1405; by the burning of the shops around it in 1436; by earthquake in 1511 (when its four corners were split) and in 1591 (when it shook from top to bottom).

The Republic, seeing its east side to be severely damaged, consulted two engineers of fame and ability—Signor Zandrini, of Venice, and Signor Polene, of Padua—to examine and repair it. These engineers said the whole wall wanted support, and they proposed building a new wall against the old one. This was done. But the new wall was never properly tied to the old one. The two were practically separate, and so the weight of the Campanile was borne unequally. Now comes a critical point. The loggetta (little marble hall) built by Sansovino rested against the eastern wall of the Campanile. It had almost a flat roof. To prevent the rain beating against the Campanile and running down its side from entering this marble hall, a row of slabs of stone sloping downwards was inserted in the Campanile where the roof met it. Only the week before the catastrophe these stones were begun to be removed as the rain was somehow getting into the loggetta, and a lead sheeting was to have been substituted. Instead of carefully removing one stone at a time, they removed half of them—they were all taken out together, that is 25 ft. of them. Not only so, but they dug through the new wall of the Campanile, that of 1745, and struck the old original wall, which they found separate from the new and full of holes and cracks. Whilst working the old wall slipped down an inch or two. Instantly the cut made was built up, but it was too late.

"Designed by Giotto": A Factory Chimney.

The fall of the Campanile directs special attention to the singular work of Messrs. Harding & Richardson, of Leeds, who, instead of putting up an ordinary factory chimney, have erected a square tower modelled on the beautiful Campanile designed by Giotto, at Florence. It was necessary, on account of the operations of steel grinding, wire pickling, &c., to devote particular attention to ventilation, as well as to have a chimney shaft which would take off the waste products of combustion from a range of Lancashire boilers; and this chimney shaft has been built of such dimensions as to provide suction power not only for working the boilers but also for ventilating the shops. Much discussion has taken place concerning this departure from common practice, and Colonel Harding, chairman of the company, has explained that he was very anxious, in erecting a large chimney, not to add another eyesore to those already visible in the city.

THE CAMPANILES OF ITALY.

"CAMPANILE" in Italian has the same signification as "bell-tower" in English, "*clocher*" in French, and "*Glockenthurm*" in German.

In Italy there are very few churches with bell-towers on the flanks of the façade or rising near the apses.

In other countries, on the contrary, limiting oneself to old Europe, church façades with two towers are numberless.

In the same way, in Italy, there are very few churches with more than two towers, as we see in the case of the cathedral at Palermo and at Borgo S. Donino, and fewer still are those with a single tower in the middle of the façade, as in the case of the churches of S. Maria del Tiglio, at Gravedona (Lake of Como), and S. Matteo in Campo d'Orto, at Perugia. So almost all churches have single bell-towers, and some that are isolated, but erected quite near to the church building. In this last category may be mentioned the cathedrals at Pisa and Florence, the Church of S. Zeno at Verona and St. Mark's at Venice.

The oldest bell-towers on the Peninsula are surely the Byzantine ones at Ravenna, round like that of S. Apollinare in Classe—the most beautiful of the Byzantine towers of that city, which might be called an Italo-Byzantine Pompeii. The tower of S. Apollinare in Classe dates to the same epoch as that of S. Apollinare Nuovo at Ravenna, generally given as the eighth century.

A beautiful round tower of the same kind is that of SS. Giovanni and Paolo, also at Ravenna, lately brought out into sight by means of reasonable restorations. In short, the Byzantine towers of Ravenna by reason of their form or by their construction are remarkable specimens of the most ancient bell-towers in Italy. This emphasizes the fact that the most ancient bell-towers there were often round. The bell-tower of S. Satiro at Milan is considered to be the oldest of the square bell-towers, the square form having remained characteristic of almost all the Italian bell-towers. This is a structure of the ninth century, of serious character and simple motive, one of those monuments which are always preserved with the greatest care. Milan and Lombardy possess several of the finest Italian bell-towers, among others the tower called "dei Monaci" of the basilica of S. Ambrogio.

But for artistic towers we must leave the centuries earlier than the year 1000, and turn to the eleventh, twelfth and thirteenth centuries. It must be remarked, however, that some amongst these towers which date back beyond the year 1000 one would like to call older yet. This, also, might be said of several of the mediæval churches in Italy. For example, the tower of S. Maria in Cosmedin at Rome. By its side we find that of S. Maria in Trastevere, which dates from the time of Innocent II. (1130-43), and also that of S. Maria Maggiore, the origin of which does not go back farther than the twelfth century. It is evident that this tower has been restored, and history tells us that these restorations took place in the times of Gregory XI. (1370-78) and Paul V. (1605-21). Bell-towers are typical of the Eternal City, and one must bear this in mind. Rome possesses such remarkable towers as those of SS. Giovanni e Paolo, a work of the twelfth century, and S. Croce in Gerusalemme, built at the end of the same century, a century which inspired the architect of the tower of S. Spirito in Sassia, who, like the modern eclectic architect, introduced forms belonging to the full Renaissance.

The centuries following the year 1000 bring us to the more celebrated towers of Lombardy, Emilia and Tuscany. There is the "Torrazzo" at Cremona, admirable in its elegance and in its fineness of ornament, a *chef d'œuvre* of great renown, which surpasses, and by much, that of the city in which the tower rears itself, where it is esteemed like a jewel in its casket. It is entirely a brick structure, a material greatly used in Lombardy and Emilia. The tower of S. Gottardo at Milan consists of several storeys, crowned by a conical roof carried on a circular colonnade, and the brick and the discrete polychromy give it a decorative aspect which is very striking. Its date is the first half of the fourteenth century, which speaks to us of an age extremely happy for Italian fabrication.

In accordance with Italian Chauvinism "La Ghirlandina," that is to say, the tower of the Cathedral of Modena, is the peer of the Torrazzo, but the tower at Modena is very far from possessing the beauty of the Torrazzo. The Modenese, however, do not esteem their tower any less than the Cremonese esteem the tower of their cathedral, for in certain Italian towns there exists a true communal pride in their own monuments, and very often the most remarkable monuments are used as symbols of the city. The lower or square portion of the Ghirlandina was built, it appears, at the same time as the cathedral, and finished in 1159. Above this portion of the structure rise the octagonal and pyramidal portions which were built between 1261 and 1319, according to the plans of Arrigo da Campione. Lately, the restorations carried out on the tower at Modena have cost the city a large sum.

Near Modena, at Bologna, in Emilia, the towers "degli Asinelli" and the "Garisendi" enjoy the highest reputation. The first belongs to 1109, the second to 1110. These are two leaning towers, but civil and not ecclesiastic.

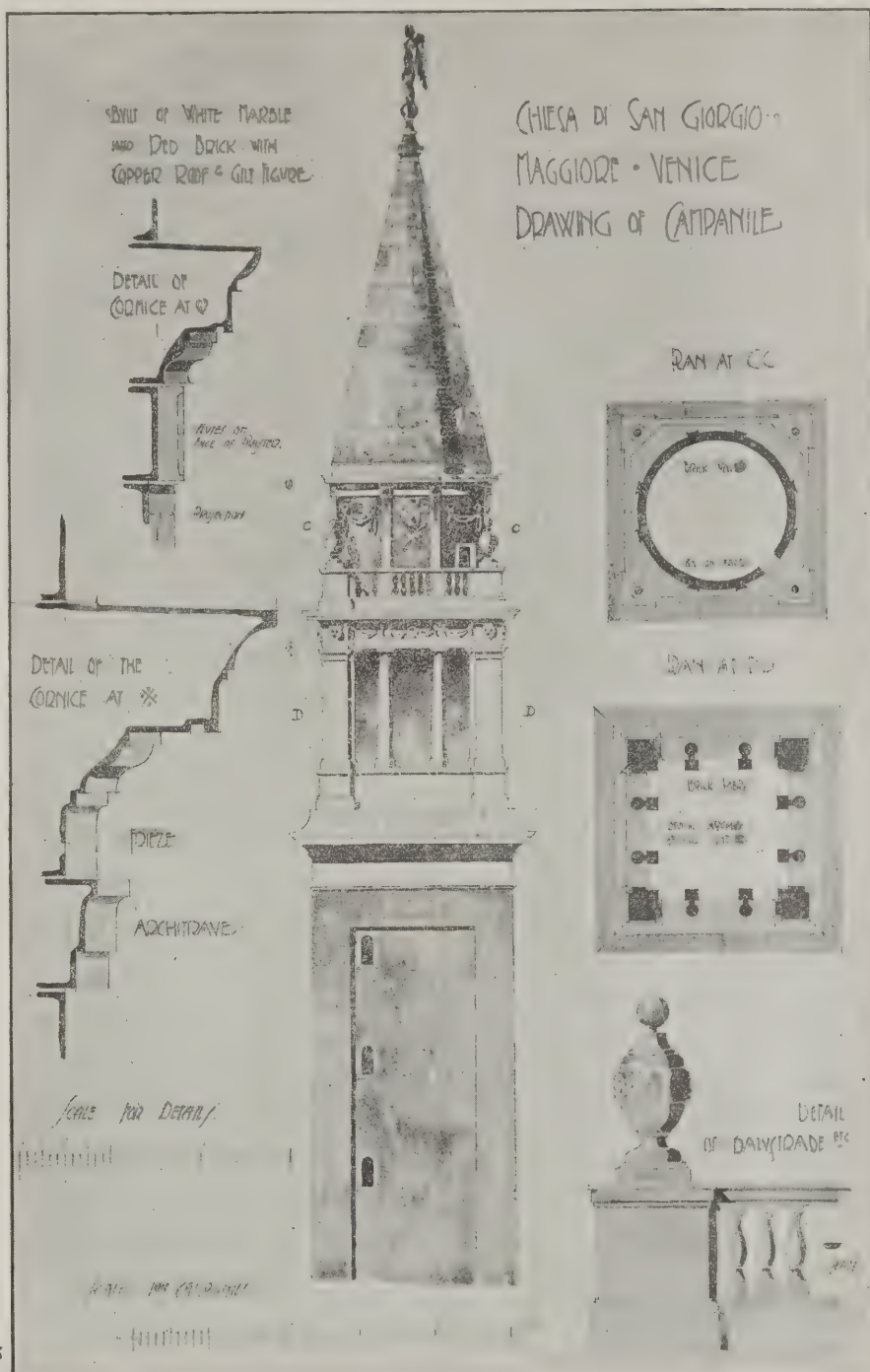
Everybody knows the "Campanile of Pisa," better known for its inclination, perhaps, than because of its open loggia treatment, too much repeated. It was finished in 1174 by the architect Bonanno, and, most often, like the towers of Bologna, it is admitted that its inclination is accidental. Upon this subject we can remark that when the inclination was discovered in the lower vaults the architect endeavoured to apply a remedy, and history tells us that during a certain length of time the work was stopped, and it was then that the architect was changed. Bonanno was replaced by Guglielmo of Innsbruck, who did not, however, continue the work to the end, as the tower was finished by Tommaso de Pisa, to whom reverts the honour of having placed upon the summit of the tower a bell chamber.

Quite near Pisa are Lucca, Pescià and Pistoja, whose respective cathedrals have important towers. The tower at Pescià, unfinished and dating from the middle of the fourteenth century, is very little known. Its robust and simple construction does not deprive it of grace, but it would be wrong to accord it the importance which the pretty tower at Pistoja deserves. This tower, which rises square in plan to the very top, recalls the open loggia treatment of the campanile at Pisa, although at Pistoja the use of these loggias, common to the Romanesque architecture of Tuscany, is more modest. The decoration of the tower, in white and dark green marble, gives it an air of lightness while preserving to it its imprint of majesty. The author of the tower of Pistoja is not known, as are the authors of the campanile at Pisa, but his style indicates the epoch—the end of the thirteenth century or the beginning of the one following.

The railroad leads from Pistoja to Florence in forty minutes. Florence possesses the most celebrated tower in all Italy, a glorious monument which at once calls up Giotto's name. The tradition of ages gives to Giotto the honour of being the architect, and, although this tradition may be devoid of all authenticity, in Italy, at least, one cannot separate the campanile at Florence from the name of the reviver of Italian painting. It is very sure that Giotto laid the foundations of the tower in 1334, but, dying in 1336, he was replaced by Andrea de Pisa, who ought to be called Da Pontedera; but this master whose place in the history of art is that of a sculptor and in no way that of an architect, was dismissed because he desired to introduce certain changes in the tower. It was then that the Florentines entrusted the direction of the work to Francesco Talenti, the real architect of the campanile of Florence; that is to say, the architect of the upper storeys, the most beautiful and glorious portions of the construction.

In Southern Italy at Apulia we find the tower of Trani, a monument of particular importance, because it is signed by an artist who has some points of resemblance with Talenti, as being long forgotten. This is "*Nicolaus sacerdos et protomagister*," who built a great portion of the tower, finished in the second half of the fourteenth century. In Apulia, also, admirers of towers will find at Bitonto the campanile of S. Leo, a work of the thirteenth century, simple, logical, robust and elegant.

In Sicily, whose mediæval architecture has a



MEASURED AND DRAWN BY J. FORBES-SMITH.

peculiarly Arabo-Byzantine-Norman-Sicilian eclectic air are the towers of Monte S. Giuliano and of Girgenti. The most important Sicilian bell-tower, however, is that of the church called the Martorana, at Palermo.

At length, taking our way northward, after the Gothic tower of the Cathedral of Albenga, near Genoa, one of the most beautiful in Liguria, after the tower of S. Agnese in Genoa, dating from 1260, and, on the north side of the Peninsula, after the tower of the Abbey of Pomposa, a monument which even in Italy has remained too much unknown, we may take leave of the subject by reference to the Tower of S. Mark at Venice. A leaning tower, this one, too, but not sensibly, as in the case of the towers of Bologna and Pisa, but which possesses the strange peculiarity of having no stairs. Instead of staircases there are inclined planes, on which you can ascend to the top of the Venetian tower afoot, on horseback or on bicycle, if you will. It is enough to cast one's eyes over the monument to perceive that it belongs to two epochs profoundly different, and that the tower of S. Mark's, begun before 948, was begun anew in that year, according to some, or in 1068, according to others, or in 1147, according to still others, and in the course of the centuries under-

went several periods of construction before its completion. The records speak of works dating back to 1310, to 1489, to 1511; in fact, in 1489 a thunderbolt struck the tower, and Giorgio Spavento designed the restorations, and in 1511 a thunderstorm again damaged the structure. It was then that the Tower of S. Mark received the upper storey, according to the plans of Bartolomeo Buon, of Bergamo.

To point out one more interesting detail: it was pretended that the foundations of the tower were as deep as the tower is high, and likewise that these foundations were star-shaped in plan. Although these assertions are found in books and are widely disseminated, I draw attention to the fact that during the excavations carried on in 1865 it was learned that the foundations of the tower of S. Mark are not over 5 metres deep, and there is nothing remarkable in such a depth as this. [Extracts from an article by Alfredo Melani in the "American Architect."]

[Note.—The large church of S. Giorgio Maggiore, the upper portion of the tower of which is illustrated on this page, is on an island opposite the ducal palace at Venice. It was built by Palladio, and is a good example of the faults and merits of his style.]

Law Cases.

The Granting of Certificates: Action against a Bristol Surveyor.—At the Bristol Summer Assizes recently the case of *Porter and Another v. Saise* was heard. This was an action brought to recover damages for alleged negligence on the part of the defendant in giving certificates relating to certain buildings. Defendant denied giving false certificates, and counter-claimed for £38 17s. for work done and professional services rendered.—Lord Coleridge, K.C., put the circumstances before the jury. Messrs. Porter & Lewis were the plaintiffs, and Mr. A. J. Saise, architect and surveyor, was the defendant. The latter was surveyor to the Kingswood District Local Board. In 1900 Messrs. Porter & Lewis purchased a certain plot of land at Kingswood for the purpose of laying it out for buildings. On May 17th a building agreement was entered into for the erection of twenty-six houses at a cost of not less than £125 per house, and defendant was employed by the plaintiffs to certify for advances to be made from time to time by Porter, up to £110 in respect of each house. Defendant visited and inspected the houses being built, and issued certificates for advances. Rumours got abroad as to the builder's position and the materials he used. Yet defendant did not communicate with the plaintiffs, nor withhold his certificate. It was alleged that defendant did not exercise due care or skill, but negligently and unskillfully certified for the advance of sums in excess of the real cost or value of work and materials. Plaintiffs claimed £850 damages.—The defendant said he was never told what the houses were to cost. He certified having regard to the class of buildings to be erected. He was given no specifications or quantities. He inspected the buildings each time he gave a certificate, and exercised the best of his skill and judgment. He believed the value of the work to be £1,235. Considerable damage was caused to the houses while they were left incomplete. Constant applications were made to him for advances, but he certified only for as much as he felt justified, in order to get the houses finished. It came to his knowledge that improper material was being used, and he prohibited it.—His Lordship, in summing up, asked the jury to say whether they thought that in granting certificates Mr. Saise exercised reasonable care, skill and judgment, which were expected from an experienced surveyor. The jury gave a verdict for the defendant, and judgment was entered accordingly. Plaintiffs' counsel said that, in regard to the counter-claim, it had been agreed that defendant should receive £25.

A Case affecting New Streets.—At the Lambeth Police Court on Thursday last Mr. Hopkins heard a summons taken out by the Camberwell Borough Council against Mr. Frederick End, of Eweline, Half-Moon Lane, Herne Hill, to recover the sum of £26 17s., being the proportion apportioned upon him, as an adjoining owner, of the estimated cost of paving the footways of Half-Moon Lane. The point at issue was whether the council were entitled to deal with Half-Moon Lane as a new street within the meaning of section 105 of the Metropolitan Local Management Act, 1855. Mr. Hopkins, in giving judgment, said that up till about as late as the year 1873 or 1874, and probably as late as the year 1880, this road might have been very well described as a thoroughly good old suburban London road, with nice houses on each side of it—twelve or thirteen in the whole length, perhaps—with good gardens, with drives and lodges. Now, the whole of the estates had been cut up, and roads had been run through the gardens and grounds, and houses had been built, and the whole neighbourhood had altered its character. He found as a fact that the lane had become a new street within the meaning of the statute, and his judgment, therefore, was for the Council for the amount claimed from the defendant.

Ancient Lights in Fleet Street.—The case of *Cooling v. Rust* recently came before Mr. Justice Swinfen Eady. It appeared that the plaintiff was the occupier of No. 47, Fleet Street, where, since 1885, he had carried on business as a dealer in pictures and works of art. His case was that, as the greater part of

the light of his shop window came over certain old buildings, the erection by the defendant of his new buildings, of an additional height of 10ft. 6in., had seriously diminished and obstructed the light. The plaintiff further alleged that on February 14th, 1901, before the new buildings were erected beyond the height of the old buildings, he gave notice to the defendant that he objected to the new structures being raised to any greater height than the old buildings. In spite of the objection, however, the defendant hurried on with the completion of his buildings to the additional height. The plaintiff accordingly claimed a declaration that his right to light had been injured and obstructed by the defendant. The defence was a general denial of the allegations in the statement of claim. The defendant denied that his new buildings were 10ft. 6in. higher than the old buildings, or that their erection seriously or substantially diminished or obstructed the light coming to the plaintiff's window. Mr. Edgar Ross, Professor T. Roger Smith, and Mr. Alfred Ash gave evidence in support of the plaintiff's case; and Mr. B. Tabberer, architect, of 13, Basinghall Street, and Mr. George Pearson, architect, of 58, Moorgate Street, entered the box on behalf of the defendant. Judgment was given for the plaintiff for £150, with costs.

Admiralty Buildings Arbitration.—At the Surveyors' Institution on Friday last, before Mr. E. A. Gruning sitting as arbitrator, the hearing was resumed of the claim made against his Majesty's Office of Works by Messrs. Chessum & Sons, the contractors for the new Admiralty buildings, with respect to certain work which they alleged they had been called on to do over and above that specified in their contract (see p. 347 of our last issue). Sir Benjamin Baker said the underpinning work was done in a very unusual way, involving enormous extra cost. The subsoil should have been pumped clear of water, and the work then proceeded with. The Attorney-General, on behalf of the Office of Works, said that the effect of the claim would be to get rid of the contract altogether. The architect and the clerk of the works were alleged to have ordered many things which they never ordered at all, or, if directions were given with regard to them, were treated as being within the terms of the contract. As for the mode of carrying out the work in the first instance, he submitted that to clear the subsoil of water, as Sir Benjamin Baker had suggested, would have been to incur a risk that no architect would be justified in incurring. He admitted that the contractors were entitled to some additional payment for the extra pumping and piling below contract level. Mr. John Leeming, of Messrs. Leeming & Leeming, Victoria Street, the architects for the work, said that in his dealings with Messrs. Chessum he had followed the rules laid down in the specifications, and had simply given approval to the contractors' plans. He had never prepared any plans for the mode of carrying out the work, as he realised that the architects had no power to order any work involving extra cost without the sanction in writing of the Commissioners. The enquiry was again adjourned.

Masters and Men.

Notice to Carpenters going to Natal.—The system lately in force providing facilities with regard to passages for carpenters and other artisans proceeding to Natal with a view to obtaining employment on arrival is now terminated. Such persons who desire to proceed to the colony must make their own arrangements for doing so without reference to the Agent-General regarding the cost of passage, the obtaining of landing permits, or employment on arrival.

Carpenters and Joiners.—The trade union employment returns in connection with the above industries show some increase in the general out-of-work list, which is nearly 2½ per cent. of the total membership, but in the Manchester district there was a very marked reduction of unemployed, which has dropped from over 3 to 1½ per cent. At Hull the working rules have been satisfactorily adjusted. At Edinburgh, Leith and Bristol the demand for a reduction

by the employers has been submitted to arbitration and declared unwarranted. At Warrington a strike has been averted by the employers withdrawing the proposed reduction. At Alnwick an advance of 1d. per hour has been conceded. The Bradford dispute remains unsettled.

Surveying & Sanitation.

Public Improvements at Coventry.—At last week's meeting of the Coventry City Council it was decided to improve Leicester Causeway at a cost of £160, and to expend £250 in providing an outfall sewer in Berry Street.

A Refuse Destructor for Ayr is to be erected on a site in Mill Street, adjacent to the electricity works. The estimated cost is—site, £3,005 19s. 2d.; buildings, £4,090; machinery and plant, £5,643—total, £12,738 19s. 2d.

Street Names.—The proposal to call part of the new avenue between the Strand and Holborn Edward VIIth Street reminds one that there is a King Edward Road in Hackney, a King Edward Street in the City, another in Islington, one in Mile End and another in Lambeth. King Edward Street in the City is a small byway off Newgate Street, and was christened with its present royal name in 1843, after bearing a series of names of an inelegant character. Previously it was entered in the City records as Butcher Hall Lane, before that as Blow-Bladder Street, before that as Chick Lane, and, worse than all, its original name was Stinking Lane.

The Sanitary Institute Congress.—The preliminary programme of the Nineteenth Congress of the Sanitary Institute, to be held in Manchester from September 9th to 13th, has now been issued. The president of the Congress is the Right Hon. the Earl Egerton of Tatton. W. N. Shaw, M.A., D.Sc., F.R.S., will deliver the lecture to the Congress, and Sir W. J. Collins, M.D., B.Sc., F.R.C.S., D.L., J.P., L.C.C., will deliver the popular lecture. Excursions to places of interest in connection with sanitation, and a conversazione, will be arranged for those attending the Congress. It appears from the programme that more than 300 authorities, including several county councils, have already appointed delegates to the Congress, and, as there are also more than 2,500 members and associates in the Institute, there will probably be a large attendance in addition to the local members of the Congress. In connection with the Congress a health exhibition of apparatus and appliances relating to health and domestic use will be held as a practical illustration of the application and carrying out of the principles and methods discussed at the meetings; it not only serves this purpose but also an important one in diffusing sanitary knowledge among a large class who do not attend the other meetings of the Congress. The Congress will include three general addresses and lectures. Three sections meeting for two days each, dealing with (1) Sanitary Science and Preventive Medicine, presided over by Sir James Crichton-Browne, M.D., LL.D., F.R.S., F.R.S.E.; (2) Engineering and Architecture, presided over by Sir Alexander Binnie, M.I.C.E.; (3) Physics, Chemistry and Biology, presided over by Prof. A. Sheridan Delepine, M.B., C.M., B.Sc. Eight Special Conferences: Municipal Representatives, presided over by Alderman Alex. McDougall, J.P., Vice-Chairman of the Health Committee, Manchester; Port Sanitary Authorities, Alderman Walton Smith, J.P., Chairman of Manchester Port S.A.; Medical Officers of Health presided over by Mr. James Niven, M.A., M.B.; Engineers and Surveyors to County and other Sanitary Authorities, presided over by Mr. Charles Jones, M.I.C.E.; Veterinary Inspectors, Mr. W. Augustus Taylor, F.R.C.V.S.; Sanitary Inspectors, presided over by Mr. W. Bland, Sanitary Inspector, Barton-upon-Irwell; Domestic Hygiene, presided over by Mrs. W. O. Meek; Hygiene of School Life, presided over by Prof. C. S. Sherrington, M.A., M.D., F.R.S. The local arrangements are in the hands of an influential local committee, presided over by the Right Hon. the Lord Mayor of Manchester, with J. H. Reynolds, Principal of the Municipal School of Technology, as hon. secretary.

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Y: PROPOSED REBUILDING.
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Bricks and Mortar.

VITRUVIUS FOR THE WEEK.

It is necessary that an architect be intelligent, apt to learn; for neither intelligence without application, nor application without intelligence, can form the man of science. He should be skilled in literature, a good draughtsman, versed in geometry, not ignorant of optics, acquainted with arithmetic, and familiar with the history of all periods and countries. He should gently have attended the schools of philosophy, and know music, not be ignorant of medicine, acquainted with law, and skilled in the aspect of heavens and the influences of the seasons and stars.—VITRUVIUS.

Our Plates. THE new royal Infirmary at Manchester (Messrs. John M. Thompson, F.R.I.B.A., and E. Milner Allen, F.R.I.B.A., joint architects) will have seven wards, counting from the basement upwards, and enough providing accommodation for 452 patients and a staff of 230, instead of 292 patients and 123 staff at present, will only occupy the vacant space within the railings by 100 sq. yds. out of the present unbuilt area of 440 sq. yds. The frontage to Piccadilly will be a total length of 103 yds., and will consist of a central block with wing blocks separated by spaces of 12 yds. There will be a large block of buildings at the back, facing on one side onto Parker Street, and on the other into an open quadrangle, upon which also windows will look from the front central portion and the side railings. On the east and west there will be detached circular blocks with ornamental towers, and the central block will be surmounted by a clock tower. The face of the buildings will be in red brick with stone dressings, and the roof will be covered with green slates. The rebuilding with the increased accommodation will naturally give opportunities for the rearrangement of the whole institution. The accident department will form an entirely distinct group of buildings, yet in immediate touch with the wards and officers' quarters. There will be five operating theatres, one in connection with each ward, a lecture theatre to hold 250 students, a clinical laboratory with X-ray and photographic rooms, as well as departments set up for bacteriological research. The total cost is estimated at £186,822, and to avoid the necessity of interfering with the work of the institution in the meantime it is proposed that the work shall be carried out in three successive tranches, taking in all a period of six years. Before arriving at a final decision upon the plans, the Infirmary Medical Board and the Herts College authorities have been consulted, and suggestions made by them adopted.—Voysey's house at Chorley Wood, Herts, is built for himself on a lovely site about 400 ft. above sea-level. The accommodation on the ground floor is shown by the accompanying plan, the interior finishings are illustrated in our plates. The whole is very characteristic of Voysey.

The Lightning Conductor.

IN the experience of Mr. Kilgworth Hedges, M.I.C.E., secretary of the Lightning Research Committee, one or two lightning rods placed on a church or any fair-sized building are almost useless, as a flash of lightning may leave the conductor for any portion of metal work on the roof; or, perhaps, as in the case of a stroke quite recently at the Cavendish Laboratory, Cambridge, the lightning may ignore the rod altogether. There it struck a knob on the roof (immediately below the conductor, which ran down the high tower) and found its way to earth by a gas-pipe, which it destroyed. Fortunately the gas was turned off at the meters. Otherwise the building would have been set on fire. Mr. Hedges says that the authorities who are responsible for the upkeep of the national museums cannot be made to consider the responsibility they incur by trusting to one or two spikes. At the National Gallery there is one on the flagstaff, and the Tate Gallery has similar so-called "protection." The British Museum is very inadequately protected. The copper roof is considered a sufficient conductor, which, without proper connection to earth, is, to say the least, "a doubtful fiction." Again, the Victoria and Albert Museum has but one conductor. The electric-light mains running close to this were struck and fused a year or so ago. The lightning rod was apparently useless. Mr. Hedges is confident that by using a network of wires, known as the air-to-earth system, and having aigrettes instead of spikes, he has prevented any serious damage from lightning to St. Paul's Cathedral and Westminster Abbey.

Wrexham Parish Church.

A REPORT of the executive committee on the movement for the restoration of Wrexham Parish Church has been issued. It states that contracts have been entered into for the reparation of the whole of the tower (£2,424), except the last stage for the tower roof (£188); for the nave roof and clearstory (£1,846), for the south aisle and roof (£1,001), for the north porch (£93), for the north aisle (£585), for regilding the clock dials (£8), for three new windows (£18), for steel joists for adjusting the bells (£24), and for a lightning conductor (£30). These amounts, together with the orders previously sanctioned by the general committee, the portion of the architect's fees already paid (£230), and other incidental expenses, such as printing, stationery, stamps, secretarial expenses, amount to £7,767. They recommend that an estimate of £112 be accepted for draining the church, that a carved oak west door, at a cost of £83, be erected in memory of his Grace the late Duke of Westminster, K.G., and that new oak doors be placed throughout the church at a cost of £50. They have also to report that £204 will be required to finish the tower, that £250 will be due to the architect, that £60 ought to be expended on repairing the churchyard wall and painting the railings, that the restoration of the missing part of the chancel screen will cost £23, and that a considerable sum will have to be spent on putting the churchyard in order. They estimate that £950 more will be required.

St. Sidwell's, Exeter.

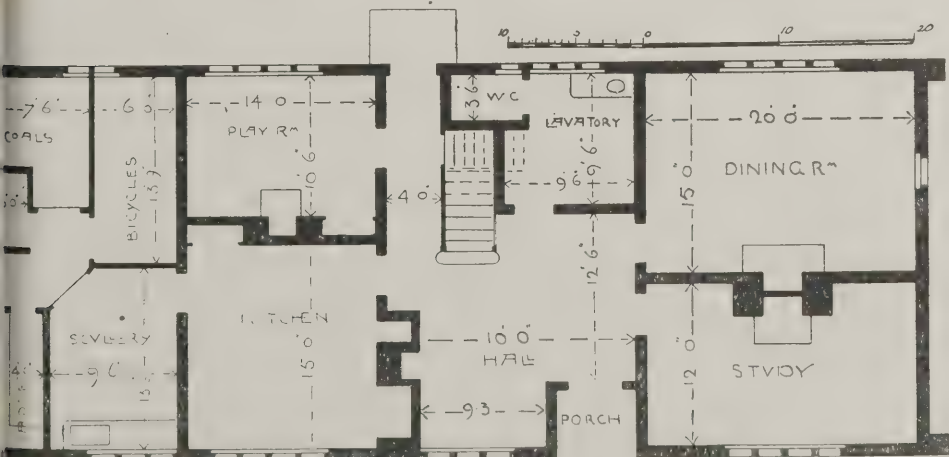
THE Bishop of Exeter (Dr. Ryle) re-dedicated the tower of St. Sidwell's, Exeter, last week. Of the earlier churches upon the site little is known, but it is on record that the fifteenth-century tower was damaged and the upper portion totally destroyed by an explosion of some gunpowder stored therein during the 1549 rebellion. Previous to its destruction by the explosion the tower and the exterior of the church were of red sandstone, perhaps better known as Heavitree stone. The ruined portions of the tower were repaired in 1606, local bricks being used. At a later period the unsightly brick was plastered with cement. Having fallen into decay, the general fabric of the church was rebuilt, but the north and south early fifteenth-century arcades of Beer stone and the tower were preserved. To the tower was added a spire of an unusual construction. It was framed of deal, boarded and covered by sheet copper, removed from the bottom of one of Nelson's men-of-war which had been broken up at Devonport Dockyard. There were also small pinnacles, and these with the monarch spire rearing its head above bore the "battle and the breeze" for many a year. Mr. E. H. Harbottle, architect, condemned the spire and pinnacles as unsafe, and their removal was effected without the aid of scaffolding within seven days. Mr. Harbottle prepared a design in which he preserved the fifteenth-century style, and now the tower of St. Sidwell's stands in all its glory as of old. The work has cost nearly £3,000. The west window and entrance have been enlarged. Mr. J. R. Gibbard was the contractor and Mr. E. T. Rogers the sculptor. A most interesting relic of the tower is the vane—"a rare and fine bird" (an illustration and some particulars of it were given in our issue for June 18th last).

A Russian Sculptor.

THE death is announced of Marc Antokolsky, the celebrated Russian sculptor. He was born at Vilna in 1842, and being in circumstances of great poverty began his career as assistant to a funeral monument provider. In leisure moments he cut crude images in wood, and finally learnt to model. At the age of twenty-two he gained a free scholarship at the School of Art in St. Petersburg. For his study of a Jewish tailor in the following year he gained the silver medal, and this was followed by a figure of a miser, which was exhibited in Paris, and at once brought him into notice. He then studied for three years in Italy at the expense of the Russian Government. His early career was devoted to historical sculpture connected with the heroes of his country, and speedily his masterly and highly intellectual work brought him to the front rank of his profession. Besides his well-known works, "Peter the Great," "Christ before the Multitude," and others, he made many portraits of the members of the Russian Royal Family, notably the bronze statue of Alexander II. in Moscow and that of Alexander III. which was lately erected in the Kremlin. Antokolsky was almost as much a Frenchman as a Russian, for he resided for over twenty years in Paris. Here his family wished him to be buried, but, by the invitation of the Russian Emperor, the relatives of the sculptor have removed his body to St. Petersburg, where he will be accorded a public funeral.

Restoring Clifford's Tower, York Castle.

THE Treasury has just promised £3,500 towards the cost of restoring the historic Clifford's Tower of York Castle. Concerning this the "Standard" says: "It is true that, from the point of view of the mediæval military architect, York Castle was never more than a minor stronghold; it could not compare with Richmond, or Middleham, or, further north, with Alnwick. But the antiquity and importance of the city it dominated, the vast rolls of history that, from first to last, have been unfolded beneath its walls, lend it a romantic attraction which is lacking even to some of the most powerful fortresses of the castle-building age. York Castle itself, altered, modernised, gutted even, has long been a prison; but the huge bulk of its keep, which was separated from the rest of the buildings by a moat, is sadly in need of that conservative repair which, it is to be hoped, it will now receive."



"THE ORCHARD," CHORLEY WOOD, HERTS: GROUND-FLOOR PLAN.
C. F. A. VOYSEY, ARCHITECT.

The Law of Excavations in Italy.

ARTICLE 14 of the new law for regulating trade in artistic and archaeological objects, and the preservation of ancient monuments, recently adopted by the Italian Government, concerns excavations. It contains this provision:—"Foreign institutes and foreign citizens who, with the consent of the Government and under conditions to be fixed case by case, undertake archaeological excavations, must give the objects they find to a public collection within the kingdom of Italy." This ought to be good news to the foreign archaeological schools in Rome, which have for years been denied permission to excavate; but the clause about the "conditions to be fixed in each case" leaves the Government a wide door open to continue the dog-in-the-manger policy which has long characterised its attitude towards excavation.

An Old Doorway.

ORTHWAITE or Allerthwaite Hall has been the residence of several of the old Cumberland families. It has in modern times passed into the possession of the Simpsons, the Richmonds and the Brownes. The arms on the keystone shown in the accompanying illustration (from a photograph by Mr. F. J. Pape) are those of Richmond impaling Salkeld, but the reason for this is not clear. We find about the middle of the seventeenth century a Richmond (Christopher), of High Head Castle, married a co-heiress (Mabel) of Vaux, of Catterton, and it is probably the initials of this Christopher that we



OLD STABLE DOORWAY AT ORTHWAITE HALL.

find upon the keystone of the stable door, with the arms and date 1675, as the Richmonds of High Head Castle owned Orthwaite at this period. It may have been the intention of the monumental mason to perpetuate at Orthwaite a former connection between the Salkelds and the Vauxs by impaling the arms of the former instead of the latter with that of the Richmonds.

A Fine Stained-glass Window has been erected in the north chapel of St. Peter Mancroft, Norwich, in memory of Archdeacon Pelham Burn. It is of five lights in fifteenth-century style and has been designed in harmony with the great east window in the adjoining chancel. Below is a gunmetal tablet with an appropriate inscription. A carved oak screen has been erected between the chancel and the north chapel as a memorial to the Rev. Charles Turner. It was designed by Mr. Bcdley, R.A., and is well worthy of comparison with the many similar ancient screens characteristic of Norfolk churches.

Engineering Notes.

At the Royal College of Science, Ireland, electrical engineering is to be taught, in place of the Chair of Mathematics now abolished.

Proposed Electric Lighting of Truro.—The Corporation of the City of Truro have resolved to consider the subject of lighting the city by electricity. A special committee has been appointed for this purpose, with Mr. Silvanus Trevel, P.S.A., as chairman.

The Swale Bridge.—At a large public meeting held at Sittingbourne on Wednesday last, and including brickmasters and brickmakers, a resolution was passed protesting against the Government, through the medium of the Admiralty, having overridden the unanimous decision of the Committee of the House of Commons, to whom the South-Eastern and Chatham and Dover Railways Bill was referred, that the bridge over the Swale should open to all vessels whether with fixed masts or not.

Society of Engineers: The Southampton Quay Works.—On Wednesday last the members and associates of this Society visited the works of the new graving dock and the widening of the old extension quay at Southampton, and afterwards inspected the Southampton Corporation Waterworks at Otterbourne. The graving dock was designed by Mr. W. R. Galbraith, M.I.C.E., consulting engineer to the South-Western Railway Co., and the contract was let to Messrs. John Aird & Co. early in 1901. The old extension quay was built in 1875, and has a minimum depth of water of 20ft. at L.W.O.S.T. This depth has of late years become quite insufficient, and it was therefore decided to deepen it. To effect this it was resolved to dredge to the required depth (30ft. below low water), at a distance of 50ft. from the existing wall, and to cover the intervening space with a platform. The design of this platform was the next problem. It is found that timber is very soon destroyed in Southampton water by the ravages of the wood shrimp, which in a few years eats a large timber through. Accordingly it was decided to build the platform of ferro-concrete on the Hennebique system. Piles of this material are built up in vertical moulds, in which are placed the long steel rods which really give the required strength. These are laced together with wire stirrups, and Portland-cement concrete of excellent quality is carefully put into the moulds and rammed round the steel. After a month the pile is taken out of its mould and conveyed to the quay, where it is driven in position much like a timber pile would be. The ram is exceptionally heavy, however (30cwt. generally). The head of the pile, too, is protected from being bruised by covering it with a helmet or iron case filled with sawdust. Moreover a timber dolly is always used. It was found impossible to drive the piles down to the required depth, especially in the front row, where they had to go 22ft. into the ground through gravel and hard sand. To overcome this difficulty the water-jet system of sinking was introduced. But as beds of gravel and clay occurred it was impossible to sink with the water-jet alone. Accordingly arrangements were made to drive and pump simultaneously. The water is fed down a $\frac{3}{4}$ in. pipe buried in the centre of the pile and ending in a $\frac{3}{4}$ in. nozzle at the point of the shoe. It is supplied from the hydraulic pressure mains, containing water at 750lbs. per sq. in. The result has been entirely successful, and the piles are driven to their depth in less than an hour. When the piles have been driven the concrete round the head is to be stripped off, and the steel rods for the various beams and struts laid in position. Each set of rods is laced with wire or hoop steel and surrounded with a timber casing. Into this casing concrete is poured and rammed and each beam or strut thus built up *in situ*. A flooring of rolled joists and timber decking is laid on top of all. This will contain rails for the trucks and for the hydraulic cranes. The engineer for the new dock works is Mr. W. R. Galbraith, M.I.C.E., and the resident engineer is Mr. F. E. Wentworth-Shields, A.M.I.C.E., who has kindly supplied the foregoing particulars of the works. The contractors for the works are Messrs. John Aird & Co., who are represented by Mr. J. W. Landrey.

The President of the Iron and Steel Institute, Mr. William Whitwell, entertained the council of the Institute at dinner, at the Grand Hotel, on Wednesday evening last.

The New "Tube" Railways came up for much discussion in the House of Commons last week. Eventually the Bills for the following railways were read a second time:—Baker Street and Waterloo; Brompton and Piccadilly; Charing Cross, Euston and Hampstead; Great Northern and Strand; London United.

A Threatened Tunnel Subsidence.—The tunnel between Grove Park and Chislehurst Stations, on the South-Eastern main line, has been closed owing to the scaling of certain parts of the wall. It is nearly 1,000yds. long and was constructed about forty years ago. It consists of five rings of brick, the thickness being about 2ft.

Important Scheme for Improving the Quayside at Newcastle.—A really comprehensive scheme for the improvement of the Quayside at Newcastle-on-Tyne has been decided on. It has been proposed by the city engineer, and provides for the extension of the quay eastwards, right to the St. Lawrence Sanatorium. To carry out his proposal involves the building of a bridge over the Ouseburn, and the construction of a stone quay wall nearly all the additional distance. When completed, the new quay will afford additional berthing accommodation of more than 1,000yds. The cost is placed somewhere between £60,000 and £100,000.

A Steel Frame Building now being constructed in New York will probably be claimed as the most curious, if not the highest, building of its kind in the world. In plan it is a triangle, with a base of 171ft. and a perpendicular of 86ft. Its height it to be 285ft., and it will have twenty-one storeys. In order to meet the great wind-pressure to which it will be subjected, the bracing of the steel skeleton frame has been designed so as to secure great rigidity. The weight of its floors, including beams, girders and masonry, is about 100lbs. per sq. ft. The steel skeleton frame requires about 3,680 tons of steelwork.

Britannia Pier, at Great Yarmouth, which has been erected at a cost of £70,000, is 810ft. long, with a width of 45ft. to 55ft. At the further end it expands to a width of 144ft. Steel screw piles, with girder supports, have been employed in the construction, with logs of Australian karri wood at the landing-stage head. There are 104 steel piles, screwed to an average depth of 15ft., and 200 logs, driven to an average depth of 20ft. The pavilion will accommodate 3,000 persons. The interior is constructed on the lines of a theatre, with a wide gallery. Outside, on the same level, a balcony runs round the whole structure. Beyond the pavilion there is a promenade deck leading to the landing stage.

A New Bridge has been erected by the Cambrian Railways Company over the estuary of the Mawddach at Barmouth. The bridge has been built on graceful lines by the Cleveland Bridge and Engineering Company. It is supported on steel cylinders, which have been sunk into the granite rock below the bed of the river, a depth of about 100ft. below high-water mark. A portion of the structure is so arranged as to form a swing-bridge, which will leave two clear waterways, each 50ft. wide. The new bridge has been built around the old one, and the work of reconstruction has been carried on in such a manner that the railway traffic has not been interrupted during the two years the operations have been in progress.

A New Electrically-Swung Bridge.—The swing span of the new Pymont Bridge, Sydney, weighing 800 tons and containing 1,400 sq. ft. more floor-space than the huge swing at Newcastle-on-Tyne, has recently been operated by electricity, the trial of the apparatus proving highly successful. The opening of the span occupied eighty seconds. Only 300 volts, however, were applied, as it was considered undesirable, until the motors had been thoroughly wired out, to utilise the full available potential of 550 volts. It will be possible to swing the bridge in less than the contemplated sixty seconds, which it is believed will make the swing the fastest in the world. The electric equipment has been supplied by the Australian General Electric Co. Messrs. McCormick & Son are the contractors for the swing span.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, July 23rd, 1902.



ENTRANCE FRONT.



THE HALL, LOOKING SOUTH-WEST.

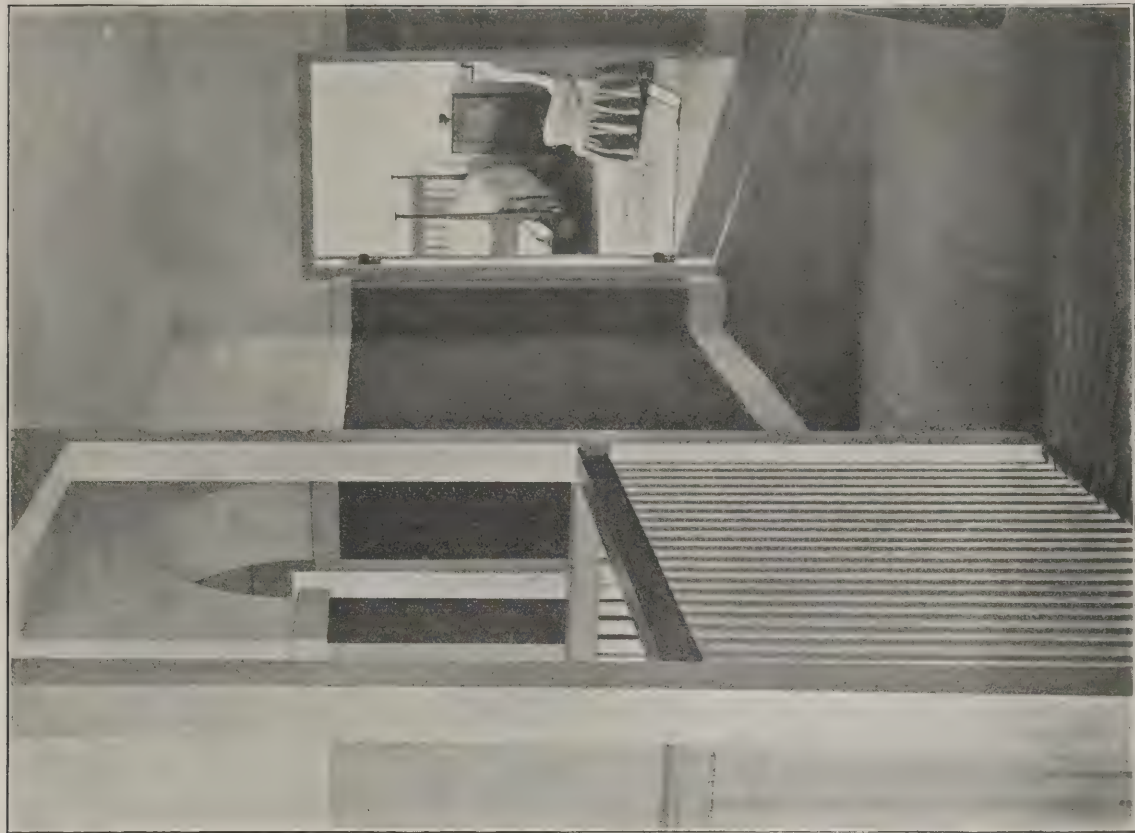
"THE ORCHARD," CHORLEY WOOD, HERTS. C. F. A. VOYSEY, Architect.



THE DINING-ROOM.

"THE ORCHARD," CHORLEY WOOD, HERTS.

C. F. A. VOYSEY, Architect.



LANDING, FIRST FLOOR.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Society of Architects.

EDGERTON.—ARCHITECT writes: "To whom should I apply for particulars of the examinations necessary to become a member of the Society of Architects?"

Apply to the Secretary of the Society, St. James's Hall, Piccadilly, W.

Exemptions from R.I.B.A. Examinations.

BIRMINGHAM.—J. B. S. writes: "I purpose going in for the R.I.B.A. Preliminary Examination next November. Would first-class certificates (Board of Education, South Kensington) exempt me from the geometrical drawing and freehand from the round examination?"

First-class certificates in the subjects mentioned will exempt you. Further information is given in the R.I.B.A. Calendar, to be obtained from the offices, 9, Conduit Street, W., price 2s. 6d.

Architectural Design and Drawing.

LONDON, N.W.—F. W. writes: "Kindly name some book which gives accurate copies of plans and elevations of small buildings which can be easily reproduced. I am not in any office at present, but should like to obtain some knowledge of this kind of work."

You will need to adapt your design to the requirements and the site, and you should study the usual books on building construction and planning, such as those given in Mr. Batsford's list. The manner of preparing working drawings is given in Mr. R. Phené Spiers' book on Drawing, published by Cassell & Co. "Modern House Construction," 6 vols., edited by G. Lister Sutcliffe, £2 8s. nett, is a very good book for your purpose. It can be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C.

Cheap Roofs.

PRAY.—C. J. D. writes: "Kindly give a rough sketch with scantlings of the cheapest form of wood roof principals (for high and low pitch) for a span of 28ft. between walls, to be covered with tiles 15in. by 8in."

See "Specification, No. 5," and an article on "Cheap Roofs, and Coverings," by G. S. Mitchell, in "Specification, No. 4."

The Orders.

ROCHDALE.—W. D. T. writes: "(1) What rules regulate the use of the Orders above one another? Name a Roman example of such use. (2) Explain and illustrate the main differences between the Greek and Roman Doric Orders. (3) Name two ancient examples of the Doric, Ionic and Corinthian Orders," &c.

See R. Phené Spiers' "Orders of Architecture" and Banister Fletcher's "History of Architecture." We cannot waste time and space in answering such elementary examination questions.

Books on Sanitary Subjects.

LANCASTER.—C. C. writes: "What books are required for the examination in practical sanitary science?"

Mr. B. T. Batsford, of 94, High Holborn, publishes a list of standard works on the subject.

Scagliola.

LONDON, E.C.—T. G. writes: "Scagliola is proposed to be used in certain large buildings in London, but it will be on walls of large area. The ordinary method of slabs will be difficult, not to say tedious, or even executing the work in situ. I am informed there was a process in use about forty years ago, termed the brush-on-dry process, which was not only quicker, but cheaper than the present process. Can you supply any information on the matter?"

We have never heard of such a method, and we rather doubt if it has ever been employed, for the advantages it offers would surely have

assured the continuance of its use. If any of our readers know of such a method we should be glad to hear from them.

Reflection of Light from Building Materials.

WEST HARTLEPOOL.—H. B. writes: "What is the relative percentage of light reflected from different substances, particularly brickwork and obscured glass, or, to put it another way, what is the relative percentage of light absorbed?"

There are experiments recorded upon the relative heat absorbed by different colours, variously coloured cloth being laid upon snow for the purpose, and other experiments upon the transmission of heat through various materials, such as hair-felt, sand, &c. There are also experiments upon the comparative amount of light absorbed by various kinds of glass used as gas globes, but I know of none upon the reflection of light from various building materials. The reflection of light in the case of glass will depend largely upon the angle of incidence, and in the case of brickwork upon the colour and nature of the surface, white glazed bricks reflecting the most. HENRY ADAMS.

L.G.B. Regulations.

MANCHESTER.—CONSTANT READER writes: "Does the Local Government Board issue instructions as to cubical contents, &c., for the housing of the working classes in a similar way as for schools, and, if so, where can I obtain them?"

We do not know of any special instructions dealing with this matter issued by the Local Government Board. The legal enactment controlling this type of erection is the Housing of the Working Classes Act, 1890. Copies of this Act and of the L.G.B. regulations may be obtained through any bookseller, or direct from Messrs. Eyre & Spottiswoode, East Harding Street, Fleet Street, E.C.

R. W. C.

Stresses on Lattice Girder.

WORKINGTON.—QUAERENS writes: "Is the enclosed 'stress diagram' correctly drawn; if not, how should it be done? Also, how is the stress on vertical bar P—16, which is necessary in drawing the stress diagram, determined? Is it half the pressure on the support or half the reaction, as I have taken it?"

The accompanying frame and stress diagrams show the proper working of this case. Commence numbering on the left-hand side, go round clockwise numbering all the external spaces, then the internal ones. Then by inspection find the proportion of load transmitted to 1-7 to obtain the stress in it, thus—

Stress in 1-7—

$$\begin{array}{rcl} \frac{2}{6} \text{ of } 10 & = & 10 \\ \frac{4}{6} \text{ of } 20 \text{ (viz., } 3-4) & = & 13\frac{1}{3} \\ \hline & & 23\frac{1}{3} \end{array}$$

Reaction 6-1—

$$\begin{array}{rcl} \text{Stress in } 1-7 & = & 23\frac{1}{3} \\ \frac{2}{6} \text{ of } 20 \text{ (viz., } 2-3) & = & 16\frac{2}{3} \\ \frac{4}{6} \text{ of } 20 \text{ (viz., } 4-5) & = & 10 \\ \hline & & 50 \end{array}$$

This will be checked by taking the other end also.

Stress in 5-25—

$$\begin{array}{rcl} \frac{2}{6} \text{ of } 20 \text{ (viz., } 3-4) & = & 6\frac{2}{3} \\ \text{Reaction } 5-6 & = & 6\frac{2}{3} \\ \text{Stress in } 5-25 & = & 6\frac{2}{3} \\ \frac{2}{6} \text{ of } 20 \text{ (viz., } 4-5) & = & 10 \\ \frac{4}{6} \text{ of } 20 \text{ (viz., } 2-3) & = & 13\frac{1}{3} \\ \hline & & 20 \end{array}$$

$$\text{Proof } 10 + 20 + 20 + 20 = 50 + 20.$$

Now construct the stress diagram and scale off the stresses in the various members, marking which are in compression by thick lines as shown.

HENRY ADAMS.

Compensation for Injuries.

GLASGOW.—ENQUIRER sends us a long statement of his case, which, however, has no bearing on technical matters. He went down a coal mine to make certain investigations and was there injured by the fall of five tons of coal. He has applied for compensation but cannot obtain any. The case, it will be seen, is rather one for "counsel's opinion" than for a legal statement in these columns. Other readers should bear this in mind.

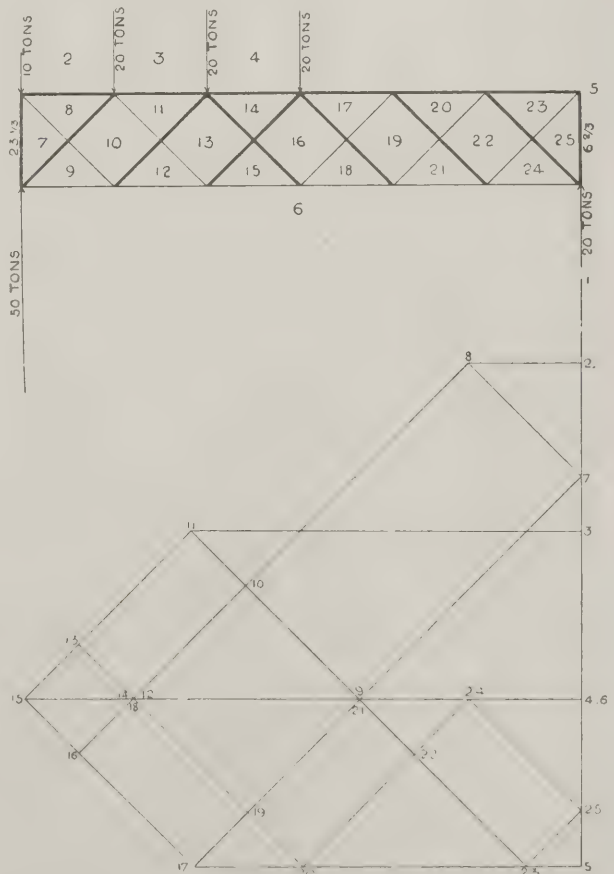
Adding a Bay to a House.

PLYMOUTH.—A. B. C. writes: "My house is one of a terrace. There is an existing bay on the ground floor projecting 2ft. 9in., and I intend (if possible) to erect another above it. I am submitting a plan of the proposed alteration to the Plymouth borough surveyor. My house is on a main road about 24ft. wide. Directly opposite is an entrance to a detached villa standing in its own ground (about a quarter of an acre), the house being 60ft. from the road. Do you think the owners adjoining or opposite can lawfully prevent me carrying out my intentions? Also, would my rates be raised?"

Your neighbours can only object to your added storey of bay window when it interferes with their own windows, and the light over which they have acquired rights if the row of houses has been in existence in its present condition for twenty years. If the houses have not been erected for that period your neighbours have acquired no right of light and air over your property, and could not interfere if you had the sanction of your local authority. In any case we think your neighbours could not sustain an injunction against you. The bay will not be likely to cause an increase in your rates, as it does not increase the actual value of your property by more than an inconsiderable amount.

R. W. C.

At Ravenhead Church, St. Helen's, a new chancel screen has been erected in memory of the late Alderman James Radley, J.P., of Sherdley Hall. It has been designed by Mr. Medland Taylor, the architect of the church, and was executed by Messrs. J. Jones & Co., of Manchester. The inscriptions are in dull copper lettering.



STRESSES ON LATTICE GIRDER.

Builders' Notes.

The New Alexandra Gardens at Windsor, laid out at the side of the river, were opened by Princess Christian last week.

Gigantic Blast at a Quarry.—At the quarries of the Welsh Granite Co., Carnarvonshire, 1,200,000 tons of rock were dislodged last week. Ten tons of gunpowder were used.

Messrs. E. J. Raybould & Co exhibit at the Royal Agricultural Show now being held at Carlisle a large assortment of all kinds of wrought-iron gates, railings, hurdles, wire fencing, &c.—all made at their works at Workington. Messrs. Raybould are the largest makers of wrought-iron fencing between Liverpool and Glasgow.

McNeill's Felts and Slag Wool.—Mr. Ernest Harry Nelson has retired from the firm of Messrs. F. McNeill & Co., of Lamb's Buildings, Bunhill Row, E.C., and the business, both as regards the firm's patent felts and patent slag wool, &c., will henceforth be carried on by Mr. George Albert Nelson alone, under the style of F. McNeill & Co. All debts due to and owing by the late partnership will be received and paid by Mr. George Albert Nelson.

The Wakefield and District Master-Builders' Association held an ordinary monthly meeting recently, Councillor Judge presiding. A long discussion took place upon the notice given by the insurance companies to increase their rates of insurance against accidents to workmen in certain risks, and other questions affecting the building trade were considered. A letter was read from the Secretary of the Yorkshire Federation recommending the local associations to alter the date of their annual meetings to the month of December, and it was decided to adopt this recommendation.

Lead Poisoning: Manufacturers Combine to Provide Gratuitous Compensation.—The pottery manufacturers, the bulk of whom carry on their business in Staffordshire, are about to form themselves into a company for the purpose of providing gratuitous compensation to all operatives engaged in lead processes. The scheme is the outcome of a report by Lord James of Hereford on lead poisoning in the potteries. Under the scheme half wages are to be paid during certified incapacity, and in case of death the widow is to receive compensation according to her circumstances, the maximum being £150.

London County Council.—At last week's meeting of the Council the Bridges Committee reported with reference to the delay in the reconstruction of Vauxhall Bridge, and stated that they could hold out no hope of the Council's entering into a contract for the construction of the superstructure of the bridge until the early part of 1903. The delay might to some extent be attributed to natural and other difficulties which had presented themselves. Not the least of these had been the rather stringent restrictions imposed by the Thames Conservancy in their efforts to secure non-interference with the traffic of the river. From time to time the contractors had been urged to press forward the work under their contract for the demolition of the old and the partial construction of the new bridge, but they had stated that they would be unable to finish before the end of this year.—The Housing of the Working Classes Committee was able to show a balance in hand on last year's working of £4,743, the gross income being £58,058.—The Council agreed to the estimate of the Highways Committee of £205,000 for purchasing and taking over the tramways of the South London Company, and of £59,000 for re-construction for electrical traction and rolling stock on the Streatham tram lines.—A discussion followed, on the recommendation of the same Committee that Parliamentary powers should be obtained to strengthen all bridges for tramway traffic. Mr. Benn explained that it was only intended to defray the cost of making the bridges capable of carrying the tramway conduits. In a case in point the necessary arrangements could be made now for £1,500, whereas later it would cost £15,000, but the Council had no power at present to incur such prospective outlay. The report was adopted.

The death is announced of Mr. Thomas Hancock, builder, of Gloucester.

Messrs. Longley & Co., builders, of Crawley, have obtained the contract for the erection of two pavilions and a mortuary at the Borough Sanatorium, Bear Road, Brighton, for £24,869.

A Sawmills Fire.—On Sunday morning last a fire broke out at the sawmills of Messrs. James M'Lean & Co., Greenock. Six buildings were completely gutted, only the walls remaining. The damage is estimated at £14,000.

Five Men Injured by Falling Masonry.—While a scaffold was being erected for the purpose of repairs being carried out in the interior of a chapel attached to the Home of the Little Sisters of the Poor, a Roman Catholic institution, in Edinburgh on Friday last, a portion of the structure gave way, and five men were precipitated 30ft. and injured.

An American Building Trust.—A trust affecting Great Britain has been formed by the principal construction firms in the United States, with a capital of sixty million dollars. The Fuller Construction Company is the chief mover in the combination, and there is almost unlimited financial backing for the trust. Several contracts have already been secured for London, and the combination intends to make determined efforts to enlarge its business in the British provincial fields.

Fire Tests with Doors.—The British Fire Prevention Committee again undertook two tests with fire-resisting doors recently at their Testing Station, Bayswater, when wood doors, protected with uralite slabs, were under investigation. There was a large attendance of visitors, who were received by Mr. Edwin O. Sachs, chairman, and Mr. Ellis Marsland, hon. secretary, and among the party were the official representatives from the War Office, Admiralty, several Government Departments and the leading Insurance, Railway and Shipping Companies. In the one case the door was protected by uralite slabs alone, and in the other case, by uralite slabs and light metal sheeting. The duration of the test was one hour and a half, at temperatures rising to 1,800 degs. Fahr., and although smoke passed through the joints between the doors and the frames, and the fire side of the door was badly injured, the fire did not pass the doors. The official reports will be issued in due course.

Dartmoor Granite.—Professor Clayden, of Exeter, recently delivered a lecture on "The Dartmoor Granite." Having described the formation of the rocks round about Devon, and the various subsidences and upheavals of the land, he went on to describe the various volcanic agencies which had been at work. On the flanks of Dartmoor they would find traces of volcanoes. Most of these, however, were formed so long ago that they had changed their appearance. Lava, of course, flowed downhill, and round Exeter there were distinct traces of lava flows. That showed that there had been intense volcanic activity, but an enormous amount of time had elapsed since that period. They found traces of basaltic lava which must have been produced through volcanic action. The question was, how did this become granite? After the volcanic agency had been spent the lava gradually cooled and through a process of chemical changes the iron in it was crystallized out. As the lava became solidified it assumed an appearance similar to that of granite.

The London Building Act and Fire Prevention.—The Fire-Brigade Committee of the London County Council is consulting the Building Act Committee with regard to cul-de-sacs in the City. They are of opinion that the state of affairs in many parts of the city to-day, as regards the conditions under which stock is kept and dealt with, is considerably different from what it was a few years ago. Owing to the narrowness of many of the thoroughfares buildings are arranged in very large floor spaces, so as to ensure the greatest amount of light being obtained. Doorways are constructed in party walls, and lifts are now more generally provided, but cross walls and protective facial work, the factors in construction which mainly operate in delaying the spread of fire, are practically non-existent. Without advocating shutter appliances, which experience led him to regard somewhat in a questionable light, the

chief officer suggests that improvements could be made at a comparatively small cost by the use of protected glass, by dispensing with wood on the exposed sides of buildings, and by more attention being paid to the construction of roofs, and, in connection with the risk to life, to the provision of alternative means of escape from buildings. It is understood that the Building Act Committee will report to the Council in regard to the use of match-boarding for walls and ceilings and many other points in connection with the proposed further amendment of the London Building Act.

Brickmakers and Tramps.—A deputation from the Manchester Brickmakers' Association, consisting of Messrs. Leach, Higgins, Normanton, Melloy and Jackson, recently waited on the Watch Committee of Manchester to ask for the protection of the premises of brickmakers by the police from the attentions of tramps and other destitute and in some cases ill-disposed persons, who at present infest the brickworks, particularly in the Cheetham district, by night. The scenes witnessed in those places are said to be of an indescribable character. The proprietors confess their inability to fence their crofts so securely as to keep out marauders, seeing that in most cases the brickmakers are yearly tenants whose profits would be swallowed up by the outlay that would be entailed. Some of the places are as much as forty acres in extent. Several persons have died of asphyxia, from the fumes of the kilns, and a number of persons have been rescued almost at the point of death. The deputation said that they had had valuable assistance from the police in the effort to clear the crofts, but the magistrates had set themselves against the conviction of persons arrested for trespassing on the places, regarding the offence as the slight one of sleeping out. Consequently, the police had ceased to take any trouble in the matter. The committee intimated that, although they might sympathise with the brickmakers, they could not instruct the police to continue to bring cases in which they knew there would be no conviction. They suggested that the only course open was for the parties who complained to send a deputation to the city magistrates.

New Patents.

The following specifications were published on Thursday last, and are open to opposition until September 2nd. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1901.—8,386, MARLES & BUTT, feed mechanism for wood-moulding machines. 10,550, LEE, printing tiles by colotype or other blocks. 12,877, BRADBURY, BRADBURY, BRADBURY & BRADBURY, hand-mortising machines. 13,096, KEW, fastenings for instantly sealing gas retorts and other doors. 13,147, UNTIEDT, sawing machines. 13,422, SUTCLIFFE, disintegrators for grinding and mixing. 13,968, HOOPEE, fastenings for doors, &c. 15,440, BEDARRIDES, elevating apparatus for pulverised materials. 15,450, TENOW & FLODSTRÖM, apparatus for conveying and piling timber. 15,567, WEST, junction of flush-pipes with water-closets, &c. 15,629, HAMBLET & SHENTON, brick machines. 15,862, MILLAR, casement windows, doors, &c. 16,006, MARCHANT, chimney-pot scraping apparatus. 16,145, ROBERTS, manufacture of caps for glazing roofs. 16,179, WILSON, screw-down taps. 16,930, WILLOCK, composition for removing paint. 17,217, DOMAN, hinges. 25,358, OHNO, automatic device for shutting fireproof doors of warehouses, &c. 26,395, OTIS ELEVATOR CO., LTD. (*Otis Elevator Co.*), lifts.

1902.—11, DENTON, bolts for doors and gates. 6,844, BOULT (*Hülsberg & Co.*), impregnation of wood and other porous materials. 1,442, HARDING, composition for covering metal and other surfaces. 8,496, COOKSEY, treads. 8,869, COX, smoke-consuming furnaces. 9,102, BÖRNER, chimney and ventilating top. 9,188, RENO, inclined lifts. 9,966, ULLRICH, chimney cowls, weather-cocks, &c. 10,458, WETMORE, glue tanks. 10,491, BARCLAY, apparatus for opening fanlights, windows, &c. 10,570, RESTALL & RESTALL, wooden lathing. 11,167, EVANS, door hinges and closing apparatus.

BUILDING NOTES AND
MEMORANDA.—VI.

By T. E. COLEMAN, F.S.I.

(Continued from p. 335, No. 387.)

THE following list of items and prices are given as indicating the average cost of builder's work in the London district, except where otherwise described. The prices quoted for "labour" and "labour and materials" respectively include the contractor's allowance for profit, use of plant, &c. :—

Excavator's Work.		Per yd. super.
	s. d.	
Digging over surface not exceeding 12in. deep - - - - -	0 4½	

		Per yd. cube.
	s. d.	
Digging in common soils in large areas not exceeding 5ft. deep - - - - -	0 7½	
Ditto in clay, gravel, &c. - - - - -	0 10	
Ditto in solid chalk, lime concrete or soft rock not requiring blasting - - - - -	1 8	
Ditto in hard rock requiring blasting - - - - -	5 0	
Digging in common soils in trenches not exceeding 5ft. deep - - - - -	0 11	
Ditto in clay, gravel, &c. - - - - -	1 4	
Ditto in solid chalk, lime concrete or soft rock not requiring blasting - - - - -	2 6	
Ditto in hard rock requiring blasting - - - - -	7 6	
Add extra for every additional 5ft. in depth - - - - -	0 4	
Return, fill in and ram - - - - -	0 7	
Basketing earth from inside to outside of building - - - - -	0 9	
Filling barrows and wheeling not exceeding 50yds. - - - - -	0 7	
Add for each additional 25yds. - - - - -	0 1½	
Filling into carts, removing and depositing not exceeding 1 mile - - - - -	2 6	
Add for each additional mile - - - - -	1 0	
Hard dry rubbish and filling in and ramming - - - - -	3 0	

		Per ft. super.
	s. d.	
Planking and strutting to sides of excavations, trenches, &c., including fixing and removal - - - - -	0 2	

Concrete Work.

Concrete composed of 1 part lime or cement to 6 parts gravel or ballast.

		Per yd. cube.
	Labour and materials.	
	s. d.	s. d.
Ground lime concrete in foundations - - - - -	2 6	10 6
Blue lias lime ditto ditto - - - - -	2 6	12 0
Portland cement ditto ditto - - - - -	2 6	15 0

		Per yd. super.
	Labour and materials.	
	s. d.	s. d.
Ground lime concrete 6in. thick in floors, &c. - - - - -	0 8	1 10
Blue lias lime ditto ditto - - - - -	0 8	2 3
Portland cement ditto ditto - - - - -	0 8	2 9
Add extra for trowelled face, including additional lime or cement - - - - -	0 4	0 7
Add extra for finishing surface of concrete with granite settings with smooth trowelled face, including additional cement - - - - -	0 5	0 9

Drainage Work.

		Per ft. run.
	s. d.	
Digging in trenches not exceeding 3ft. wide and 3ft. deep in common soils, including planking to sides where required, return, fill in and ram, make good surface of ground, and remove surplus earth - - - - -	0 6	
Ditto ditto in clay, gravel, &c. - - - - -	0 9	
Ditto ditto in solid chalk, lime concrete or soft rock not requiring blasting - - - - -	2 3	
Ditto ditto in hard rock requiring blasting - - - - -	3 0	
Add for every additional foot in depth in common soils - - - - -	0 2½	
Ditto ditto in clay, gravel, &c. - - - - -	0 3½	

		Per ft. run.
	s. d.	
Add for every additional foot in depth in solid chalk, lime concrete or soft rock not requiring blasting - - - - -	0 10	
Ditto ditto in hard rock requiring blasting - - - - -	1 2	

		Per ft. run.
	Labour and materials.	
	s. d.	s. d.
4in. diam. glazed stoneware drain pipes and jointed in cement - - - - -	0 2	0 8
6in. ditto ditto - - - - -	0 3	0 11
9in. ditto ditto - - - - -	0 4	1 4
12in. ditto ditto - - - - -	0 6	2 0
15in. ditto ditto - - - - -	0 8	3 9
18in. ditto ditto - - - - -	0 10	5 0
21in. ditto ditto - - - - -	1 1	7 6
24in. ditto ditto - - - - -	1 4	9 3

		Each.
	s. d.	
Extra only for 4in. diam. bends and jointed in cement - - - - -	0 8	
Ditto for 6in. ditto - - - - -	1 0	
Ditto for 9in. ditto - - - - -	1 6	
Ditto for 12in. ditto - - - - -	2 3	
Ditto for 15in. ditto - - - - -	3 0	
Ditto for 18in. ditto - - - - -	4 6	
Ditto for 21in. ditto - - - - -	6 0	
Ditto for 24in. ditto - - - - -	7 6	

Extra only for single junctions to be priced at the same rates as bends of same diameter.

Extra only for double junctions at double the rates of bends for the same diameter.

		Each.
	s. d.	
4in. glazed stoneware intercepting traps with cleaning eye and jointed in cement - - - - -	10 6	
6in. ditto ditto - - - - -	13 0	
9in. ditto ditto - - - - -	20 0	

		Per ft. run.
	Labour and materials.	
	s. d.	s. d.
P.C. concrete bed (6in. thick and 12in. wider than the pipes) for 4in. drain pipes, including haunching up with concrete at each side of pipes - - - - -	0 3	0 10
Ditto for 6in. drain pipes - - - - -	0 3½	1 0
Ditto for 9in. ditto - - - - -	0 4	1 3
Ditto for 12in. ditto - - - - -	0 4½	1 6
Ditto for 15in. ditto - - - - -	0 5	1 8
Ditto for 18in. ditto - - - - -	0 6	1 10
Ditto for 21in. ditto - - - - -	0 7	2 0
Ditto for 24in. ditto - - - - -	0 8	2 3

Bricklayer's Work.

		Per sq. yd.
	Labour.	Labour and materials.
	£ s.	£ s.
Stock brickwork (bricks at 40s. per M. delivered) in stone lime mortar in thick walls, as in foundations, retaining walls and heavy engineering works, with joints left rough - - - - -	4 15	15 15
Ditto in walls of ordinary buildings, including plumbing jamps, but exclusive of facings and pointing - - - - -	5 15	16 15
Ditto in walls 1 brick thick or under, and ditto - - - - -	6 10	17 10
Add extra if blue Staffordshire pressed bricks are used - - - - -	—	10 0
Extra only if in blue lias lime mortar - - - - -	—	0 10
Extra only if in Portland cement mortar - - - - -	—	2 0
Add to preceding items if in underpinning to walls in short lengths - - - - -	2 0	2 0

		Per ft. super.
	Labour.	Labour and materials.
	s. d.	s. d.
Half-brick walls in stone lime mortar worked fair both sides and finished with a neat flat struck joint - - - - -	0 2½	0 5

		Per ft. super.
	Labour.	Labour and materials.
	s. d.	s. d.
Half-brick walls in Portland-cement mortar - - - - -	0 2½	0 6
Facings. Extra to ordinary stock brickwork for facings, including pointing.		

		Per yd. super.
	Labour.	Labour and materials.
	s. d.	s. d.
Fair face and flat struck joint for limewhiting - - - - -	0 0¾	0 1
Picked stock facings finished with a neat struck joint - - - - -	0 1¼	0 2
Ordinary red facings and ditto ditto - - - - -	0 1½	0 3
Best red facings and ditto - - - - -	0 1½	0 5
Best white facings and ditto ditto - - - - -	0 1½	0 5½
Ditto ditto, rubbed, gauged and set in putty - - - - -	1 3	1 9
Ordinary blue Staffordshire bricks and finished with a neat struck joint - - - - -	0 1½	0 6
Best ditto ditto and ditto - - - - -	0 1½	0 7
Moulded brick facings and ditto - - - - -	0 1¾	1 2
Salt-glazed facings and ditto - - - - -	0 1¾	1 6
White-glazed facings and ditto - - - - -	0 1¾	2 3
Ditto, 2nd quality, and ditto - - - - -	0 1¾	1 9
Coloured glazed facings and ditto - - - - -	0 1¾	3 6
Ornamental ditto and ditto - - - - -	0 1¾	4 6
Arches. Extra to ordinary stock brickwork for arches, including pointing.		
Axed arches in socks, including pointing - - - - -	0 3	0 6
Rubbed and gauged arches and set in putty - - - - -	1 7	2 3
White glazed bricks, including pointing - - - - -	1 9	3 9

		Per sq. yd.
	Labour.	Labour and materials.
	s. d.	s. d.
Brick paving.		
Stock brick flat paving in sand - - - - -	0 10	2 10
Ditto ditto in mortar - - - - -	1 4	3 6
Ditto ditto in cement - - - - -	1 6	4 0
Stock brick-on-edge paving in sand - - - - -	1 3	3 6
Ditto ditto in mortar - - - - -	1 11	4 4
Ditto ditto in cement - - - - -	2 2	5 0
Blue Staffordshire flat paving in cement - - - - -	1 6	6 9
Ditto on edge ditto - - - - -	2 2	9 6
Adamantine or Dutch clinker in cement - - - - -	2 6	12 6
Common red and blue (6in. by 6in.) tiles in cement - - - - -	2 0	6 6
Pressed ditto ditto - - - - -	2 3	10 6
Ornamental ditto ditto - - - - -	3 0	15 0

		Per square.
	Labour.	Labour and materials.
	s. d.	s. d.
Tiler's Work.		
Pantiling, laid dry to 10in. gauge, including 1½in. by 1in. pantile laths - - - - -	5 6	25 6
Ditto bedded in mortar and pointed both sides - - - - -	9 6	29 6
Plain tiling laid to 3½in. gauge, including double fir laths (tiles 50s. per M. delivered) - - - - -	12 0	55 0
Ditto ditto 4in. gauge and ditto - - - - -	10 9	50 0
Lathing only with double fir laths for plain tiling laid to 3½in. gauge - - - - -	2 9	7 6
Lathing only with pantile laths for pantiling laid to 10in. gauge - - - - -	1 6	5 6

Slater and Slate Mason.

		Per square.
	Labour.	Labour and materials.
	s. d.	s. d.
Best Bangor ladies (16in. by 8in.) slating, zinc nailed and laid to 3in. gauge - - - - -	10	40 0
Ditto countess (20in. by 10in.) ditto ditto - - - - -	8 6	45 0
Ditto duchess (24in. by 12in.) ditto ditto - - - - -	7 3	42 0
Add extra for copper nails - - - - -	—	2 0
Deduct if laid to 2½in. gauge 2½in. by 1in. deal battens for ladies slating - - - - -	2 6	12 0
Ditto ditto countess ditto - - - - -	2 3	9 0
Ditto ditto duchess ditto - - - - -	2 0	7 0

	Per ft. super.			
	Labour.		Labour and materials.	
	s. d.	s. d.	s. d.	s. d.
3in. Bangor slate slabs, sawn to sizes, quarry-planed on face and fixed - - -	0	2	0	10
3in. ditto ditto - - -	0	2½	1	1
1in. ditto ditto - - -	0	3	1	4
Add for finely rubbed face - - -	—	—	0	2

Thatcher's Work.

	Persquare.			
	Labour.		Labour and materials.	
	s. d.	s. d.	s. d.	s. d.
Best wheat straw thatching, average 12in. thick, including spars, ledgers, spun yarn, &c., but exclusive of roof timbers	6	6	22	6

Mason,

	Per ft. cube.			
	Bath.		Portland.	
	s. d.	s. d.	s. d.	s. d.
<i>Stone and workmanship.</i>				
Stone in block, quarry scabbled, including hoisting 30ft., and set in lime mortar - - -	2	6	3	6
Ditto, with quarry dressed and squared beds, faces, and joints and ditto - - -	3	6	4	6
Stone and all labours in plain ashlar, plinths, quoins, &c., including hoisting, setting in lime mortar, and cleaning down complete - - -	5	3	7	3
Ditto ditto, in moulded strings, cornices, architraves, window jambs, lintels, &c. - - -	6	6	9	0
Ditto in circular-moulded bases to columns, &c. - - -	8	0	10	9
Ditto in swollen and diminished circular columns, shafts, &c. - - -	6	3	8	6

	Per ft. super.			
	Bath.		Portland.	
	s. d.	s. d.	s. d.	s. d.
Coursed ashlar 4½in. thick, with bond stones 9in. thick, spaced 6ft. apart, including hoisting, setting in mortar and cleaning down complete - - -	2	9	3	9

Labour on stone.

	Per ft. super.			
	Bath.		Portland.	
	s. d.	s. d.	s. d.	s. d.
Half-sawn of plain work to beds and joints - - -	0	3	0	6
Ditto ditto circular - - -	0	5	0	10
Plain work, rubbed - - -	0	6	1	0
Ditto, circular - - -	0	9	1	6
Rough sunk work to beds and joints - - -	0	5	0	10
Sunk work, rubbed - - -	0	10	1	8
Ditto, circular - - -	1	2	2	3
Moulded work, rubbed - - -	1	3	2	6
Ditto, circular - - -	1	8	3	3

Granite and workmanship.

	Per ft. cube.			
	Cornish.		Aberdeen.	
	s. d.	s. d.	s. d.	s. d.
Granite in block, quarry scabbled, including hoisting 30ft. and setting in lime mortar - - -	5	6	6	6
Ditto, with quarry dressed and squared beds, faces, and joints and ditto - - -	8	3	9	6
Granite and all labours in plain ashlar, plinths, &c., fine axed on face, including hoisting, setting in lime mortar, and cleaning down complete - - -	12	0	14	0
Ditto ditto, polished - - -	16	6	19	0
Ditto in plain moulded work as to strings, cornices, &c. - - -	15	6	18	0
Ditto ditto, polished - - -	21	0	24	0

Labour on granite.

	Per ft. cube.			
	Cornish.		Aberdeen.	
	s. d.	s. d.	s. d.	s. d.
Half-plain work to beds and joints - - -	1	2	1	3
Ditto ditto, circular - - -	1	10	2	0
Plain work, fine axed - - -	2	6	2	9
Ditto ditto, circular - - -	4	3	4	6
Rough-sunk work to beds and joints - - -	2	4	2	6

	Per ft. cube.			
	Cornish.		Aberdeen.	
	s. d.	s. d.	s. d.	s. d.
Sunk work to faces - - -	4	0	4	3
Ditto ditto, circular - - -	6	2	6	6
Moulded work - - -	5	0	5	6
Ditto, circular - - -	6	6	7	0
Plain polished face - - -	3	6	4	0

Steps and sills.

	Per ft. run.			
	Cornish.		Aberdeen.	
	s. d.	s. d.	s. d.	s. d.
9in. by 6in. York stone steps, rubbed on tread and riser, back-jointed and set in cement - - -	—	—	2	9
11in. by 6in. ditto ditto - - -	—	—	3	6
14in. by 6in. ditto ditto - - -	—	—	4	3
18in. by 6in. ditto ditto - - -	—	—	5	3
11in. by 6in. York stone, spandrel steps, rubbed on tread, riser and soffit, with fair end, birdsmouth joint and set in cement - - -	—	—	4	6
12in. by 6in. ditto, with moulded nosing and returned end and ditto	—	—	8	0

Window sills.

	Per ft. super.			
	Cornish.		Aberdeen.	
	s. d.	s. d.	s. d.	s. d.
9in. by 3in. Portland stone window sills, rubbed, weathered and throated, with stopped ends and stools, grooved for iron tongue, and set in mortar - - -	—	—	2	0
9in. by 6in. ditto ditto - - -	—	—	3	0
11in. by 4in. ditto ditto - - -	—	—	2	10
14in. by 6in. ditto ditto - - -	—	—	4	6
18in. by 6in. ditto ditto - - -	—	—	5	6

Marbles.

	Per ft. super.			
	Cornish.		Aberdeen.	
	s. d.	s. d.	s. d.	s. d.
3in. marble slab or wall linings polished one side, edges jointed and set complete. (Sicilian, dove, St. Ann's, &c.) - - -	—	—	6	0
3in. ditto black, verd antique, and similar marbles - - -	—	—	8	6
3in. ditto Siena, statuary and similar marbles - - -	—	—	12	0

	Per yd. cube.			
	Labour.		Labour and materials.	
	s. d.	s. d.	s. d.	s. d.

Waller.

	Per yd. super.			
	Labour.		Labour and materials.	
	s. d.	s. d.	s. d.	s. d.
Rubble masonry with local stone in mortar in foundations, backs of thick walls, &c., with joints left rough - - -	4	6	15	0
Ditto ditto in walls, and ditto - - -	5	6	16	6
Ditto in courses 9in. to 12in. high, including one bond stone in every 9 cub. ft.; but exclusive of facings and pointing - - -	7	6	18	6
Ditto ditto, with beds horizontal and joints vertical, the joints being squared at least 3in. from the face, but exclusive of facings and pointing - - -	8	6	19	6

	Per yd. super.			
	Labour.		Labour and materials.	
	s. d.	s. d.	s. d.	s. d.
Extra to roughly-dressed facings in random rubble masonry and pointing in mortar - - -	0	10	1	0
Ditto to hammer-dressed facings with neat struck joint in cement - - -	2	0	2	3

Pavior.

	Per ft. cube.			
	Cornish.		Aberdeen.	
	s. d.	s. d.	s. d.	s. d.
8in. by 3in. by 6in. granite setts laid in parallel courses in gravel and grouted in cement - - -	1	9	13	0
8in. by 3in. by 7in. ditto ditto - - -	2	0	15	0
4in. by 4in. by 4in. ditto ditto - - -	2	3	11	0
Taking up old granite setts in mortar, cleaning, and stacking for re-use - - -	0	4	—	—

(To be concluded.)

A New Cathedral for Pretoria is proposed to be built. The building which has done duty both as the parish church and a cathedral for twenty-five years is small, ugly and poorly furnished. It is estimated that a dignified building could be erected for £20,000.

THE SIZE OF SCHOOLS.

AT last week's meeting of the School Board for London the School Accommodation Committee presented a report upon the subject of the proposed limitation of the size of schools. The Board of Education wrote in March last informing the School Board that they had been giving careful attention to the general principles which should regulate the size of schools and the size and number of departments which they should contain, both in London and in the country; and that they were of opinion that a school should not, as a rule, contain more than 1,000, arranged in three departments of 300 boys, 300 girls, and 400 infants, or 300 senior mixed, 300 junior mixed, and 400 infants; and that only under exceptional circumstances could a school with three departments and a total of 1,200 be sanctioned, though, with an additional junior mixed department, a larger total might sometimes be accepted. They added that, as the Board of Education would bear these principles in mind when considering all plans for new schools and enlargements of existing schools, the retention of sites in the schedule would not necessarily commit the Board of Education to the approval of any proposals which the School Board might submit hereafter with regard to them. Some correspondence with the Department had taken place, and the committee now proposed that the Board should send a memorial to the President of the Board of Education upon the subject. In the course of the memorial the London School Board urge that no hard-and-fast rule should be set up, but that different managers should be left free, as at present, to try different schemes in different circumstances. In most of the schools which the Board are now building it is impossible to vary the proposed size without ruining the plan or very gravely increasing the cost; and even in the case of future schools the cost of small schools will be considerably greater. But in making proposals for future accommodation the London School Board, while hoping to modify the views now laid down on behalf of the Board of Education, will, of course, conform to their final instructions. After some discussion the memorial was agreed to.

R.I.B.A. EXAMINATIONS.

Pass List.

THE following have passed the midsummer examinations of the Royal Institute of British Architects:—

Intermediate Examination (in order of merit):—H. J. Ash, A. C. Bosson, R. E. Stewardson, J. L. Fouracre, H. J. C. Marshall, G. A. Farrar, F. G. Johnson, J. E. Braithwaite, E. G. Allen, A. F. Benjamin, D. Mitchell, W. A. Hodges, F. W. Hayward, J. W. Walker, S. C. Ramsey, W. E. Watson, Miss Bessie Potts, P. J. Westwood, N. Culley, C. L. Gill, T. T. Sawday, A. R. Powys, W. T. Loveday, F. Thorpe, H. Mac G. Bowes, R. W. Yates, A. E. Brooker, H. F. Murrell, E. G. W. Souster, L. M. Gotch, E. E. B. Claypole, J. I. Tweedie, W. W. Robinson, jun., E. G. G. Bax, M. S. Briggs, W. A. T. Carter, H. E. Clifford, R. S. Dacombe, W. R. Davison, G. T. Forrest, E. L. Haynes, A. R. Holman, R. Huggup, jun., N. T. Myers, P. C. Pilling, T. E. Richards, F. J. Robinson, E. W. Slaughter, H. R. G. S. Strong, F. A. Sprules and F. G. Stockdale.

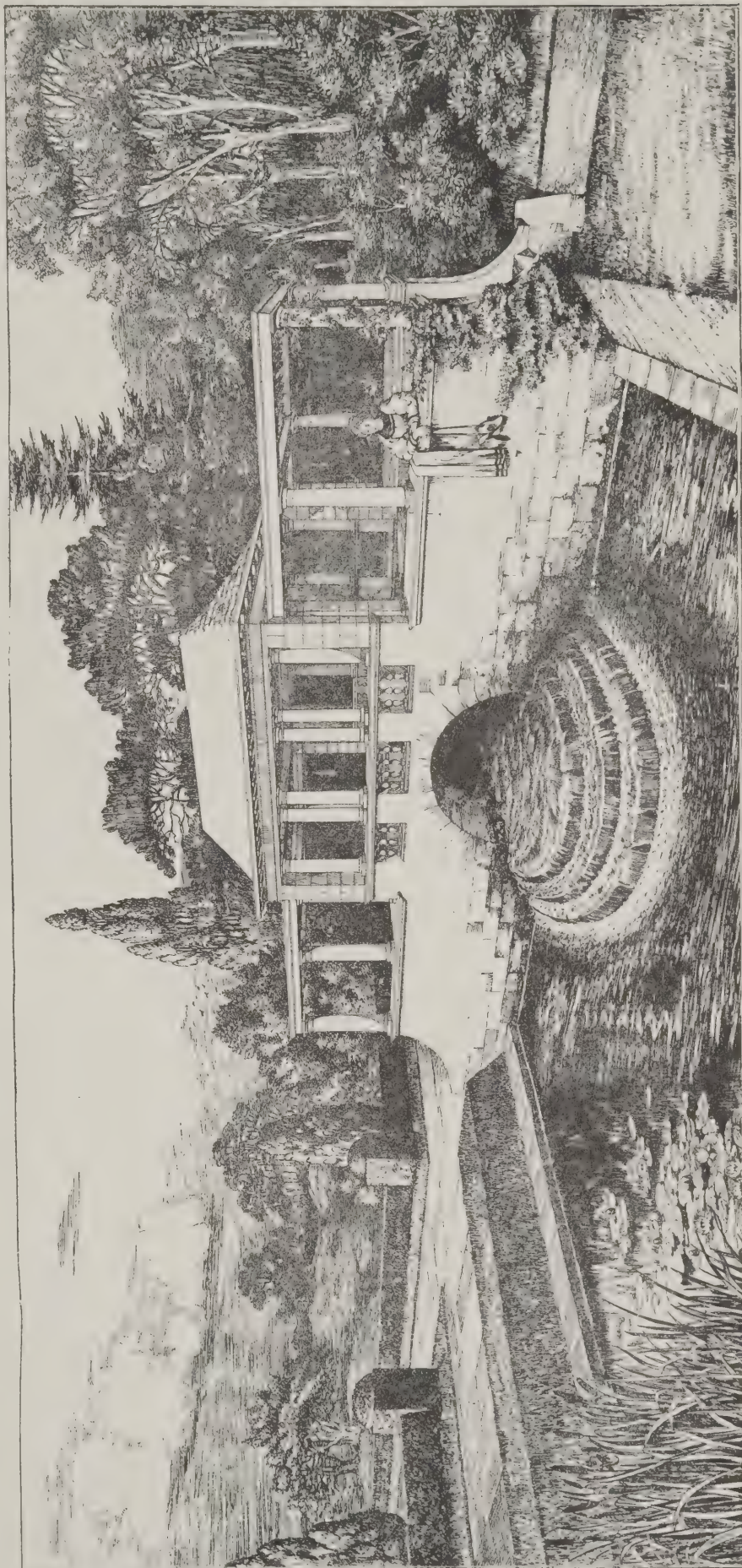
Final Examination (in alphabetical order):—G. W. Allsop, C. W. Beaumont, J. H. Belfrage, R. Berrill, J. Mac L. Bevan, H. C. Bishop, E. D. Brown, R. P. Chamberlain, H. Chapman, jun., A. R. Conder, E. F. M. Elms, R. F. Farrar, J. H. Gibbons, T. H. Gibbs, T. S. Gregson, B. Greig, P. J. Groom, P. J. Haywood, W. H. Hobday, O. Holden, A. L. Holder, H. S. Jardine, I. M. Kent, R. G. Kirkby, H. Moger, W. J. Nash, C. F. Newcombe, P. C. Newman, W. C. Oman, E. O. Payne, W. S. Payne, R. Mc M. Roberts, A. R. Robertson, J. Mac L. Ross, E. Simm, S. Smith, J. Swarbrick, G. Walker, C. F. Ward, L. Foster Ward, C. W. F. Wheeler, T. W. Whipp, H. A. Wilson, R. G. Wilson, jun., D. Wood and W. Wiggley.

THE RESTORATION OF YORK MINSTER.

WE published a few particulars of this restoration on p. 39 of our issue for March 5th last. We now give some additional facts. The damage of a fire caused by the incendiary Martin, and again by fire in 1840, was repaired at great cost, and since then there have been smaller works of restoration. The work in progress at the north-west tower, which has already occupied close upon three years, may be expected to be completed in the autumn of this year. At the present time the masons and sculptors are engaged on the third stage, which is practically the most expensive of the series of stages of the tower. The upper portions, clear of the nave aisle roof, have been completed some months, and the stages of scaffolding removed. Nothing has been attempted in the way of "restoration," in the modern acceptance of the term; the old work is being restored and renovated by a strict adherence to the minutest features of the existing fabric. Every block of plain stone, every gargoyle, whether grotesque or simple, every pinnacle, gablet, finial, is being replaced by an exact replica of that removed. The plainest outlines and the most delicate tracery are being faithfully reproduced and restored. Occasions have arisen, where it has been impossible to determine the design of the worn-away carving. Happily this has been seldom. Comparisons have usually enabled the clerk of the works (Mr. Green) to decide, the treatment being extensively repeated throughout the building. But in the rare instances where it has been impossible to arrive at a satisfactory conclusion the question has been submitted to the architect, Mr. G. F. Bodley, R.A., who has been called upon to decide or to supply the deficiency by a design approximating as closely as possible to what was believed to be the purpose of the mediæval artist. The rate of progress has not been slow, having regard to the proportions of the tower. Many of the pieces of masonry which are hoisted up to the top of the stages have weighed half-a-ton, and some have been even heavier. The authorities have discarded magnesium limestone as too susceptible to atmospheric influence, adopting in its place a coarse-grained yellow-coloured oolite, obtained at Ketton, in Rutlandshire. This stone is more adapted to the purpose than the famous Ancaster stone, which has been used in the restoration of one great cathedral, as it yields larger blocks on the bed and enables elaborate carving to be done in the solid block, rather than in sections. An approximate estimate places the cost of the work now so rapidly nearing completion at £7,000. Three months hence the staging will most likely be completely removed from the north-west tower, and the process of erecting it around the south-west tower will have commenced. It is imperative, too, to preserve the west front.

New Workhouse Infirmary Buildings at Stratford-on-Avon are being erected. The scheme includes a new laundry, fitted with the latest engineering appliances, the total costs of the works (exclusive of furnishing) being about £7,000. The tender of Messrs. J. G. Fincher & Co., of Stratford, has been accepted, to erect the new laundry for the sum of £1,415, and the offer of Messrs. Barford & Perkins, of Peterborough, to carry out the engineering work for £1,819.

Covered Bridges, &c., at Kearsney Court.—The accompanying illustration shows one of a pair of structures (one at the head, the other at the foot, of a formal canal) which are now in course of erection at Kearsney Court, Dover, which is being thoroughly renovated, and the grounds remodelled for the proprietor, E. P. Barlow, Esq. Where was formerly a swamp there is now a clear, spacious, formal pond or canal 200 yds. by 25 yds., parallel with the front of the residence, with a number of full-grown elm and beech timber trees overhanging on both sides, which take away the made appearance, the fairly strong natural stream being ample to prevent fouling. Beyond the canal the stream meanders through a bog and rock garden. The buildings are intended chiefly as summer houses. The materials used are local brick wallings, stone dressings and columns, and tiled roof.



COVERED BRIDGE AND WATER CHUTE AT HEAD OF CANAL, KEARSNEY COURT, DOVER. THOMAS H. MAWSON, ARCHITECT.

Keystones.

The death is announced of Mr. Joseph Talbot, of Messrs. Wilson & Talbot, architects, of Liverpool.

Mr. James Chaetham, J.P., architect, of Rochdale, died recently at the age of sixty-nine.

Collapse of a Gallery in an Italian Church.—A gallery in the Church of St. Francis at Prato, in Tuscany, collapsed last week.

A New Sunday School at Marshall's Cross, St. Helen's, is being built by Mr. W. Leicester, of Sutton, from plans by Mr. F. Biram. It is estimated to cost about £900, exclusive of the site.

Sheffield Market Competition.—The competition for the improvement of the Norfolk Market Hall at Sheffield (confined to Sheffield architects) has been decided as follows:—1st premium (£100), Messrs. Holmes & Watson; 2nd (£50), Mr. H. J. Potter; 3rd (£25), Mr. Joseph Smith. Sir William Emerson was the assessor.

An Isle of Man Chapel.—Plans have been prepared by Messrs. Robert Todd & Thomas Morris, junr., architects, of Gresham Chambers, Lord Street, Southport, for the Primitive Methodist Chapel and Schools at Port St. Mary, Isle of Man. The architects have been instructed to get out the quantities and obtain tenders for the work, which is estimated to cost £1,850.

Trinity Congregational Church, Reading.—A wall with an iron fencing is now being erected around this church. Messrs. Ravenscroft, Son & Morris, of Reading, are the architects, and the contractor for the stonework is Mr. Searle, of Reading; those for the ironwork being Messrs. Taylor, Tucker & Co., of Winchelsea Road, Harlesden. The contract given for the stonework is £459, that for the ironwork being £185.

A.A. Day Classes.—We have received an advanced copy of a booklet giving particulars of the new day courses of instruction in architecture instituted by the Architectural Association. The classes were opened in October last and have proved very satisfactory both as regards the number of students who attended them and the practical results shown. The winter term commences on September 29th next. Fee, 15 guineas per term for the full course, or 45 guineas per annum. Further particulars can be obtained by application to the secretary of the Association, 56, Great Marlborough Street, W.

Alterations in St. Michael's Church, Aldershot, are to be taken in hand at once, under the superintendence of Mr. Hoole, who designed the tower and built St. George's Church. The aisles and porch will be re-roofed like the nave, with pitch-pine match-boarding, and the unsightly and dangerous ceilings removed. Two new dormer windows will eventually be inserted in the roof, on the north side of the nave, and these will give extra light and air. The gas standards will be taken down and replaced by wrought-iron chandeliers with incandescent burners, which will largely reduce the annual expenditure for gas. Lastly, the chancel will be lowered a foot. The chancel floor will be laid by Italian workmen with mosaic. The steps will be blocks of coloured Devonshire marble. A dwarf iron screen will run from north to south.

A New Branch Library at Liverpool has been erected at the corner of Windsor Street and Upper Parliament Street from designs of Mr. Thomas Sheldermine, the Corporation architect and surveyor. Leading from the main central hall on the right is the ladies' reading-room. On the left is the general or men's reading-room. In the central building are the lending department and book-store. From the vestibule there is a staircase by which access is obtained to the basement, in which is situated the boys' reading-room. In addition there is a mezzanine or gallery floor, which provides accommodation for books, for the repair of books and for the staff. On the ground floor is the librarian's room, and on the first floor the assistants' common-room. The main walls are of red wire-cut Ruabon bricks with Cefn stone-dressings, and the roof is covered with Cumberland green slates. The style adopted is English Renaissance. The interior furnishings are in oak. The contract price for the building was upwards of £12,100, and the work of erection has occupied about fifteen months.

Mr. Alfred Waterhouse, R.A., celebrated his seventy-third birthday on Sunday last.

St. George's, Boto'ph Lane, in view of the congested state of the vehicular traffic in its immediate vicinity, is proposed to be pulled down.

A New Baptist Church at Catford is being erected from the designs of Messrs. Smee, Mence & Houchin, of 12, West Smithfield, E.C.

Crantock Church has been restored. The work has been carried out under the direction of Mr. Edmund Sedding, F.R.I.B.A., of Plymouth.

The Boadicea Statue.—The bronze group of statuary depicting Boadicea and her daughters in a war chariot was unveiled on the Thames Embankment at Westminster Bridge on Thursday last. The late Mr. Thornycroft was the sculptor.

Mr. E. W. Mountford, F.R.I.B.A., has been appointed consulting architect and assessor to the Bristol Corporation in regard to the designs received in competition for the New Central Library.

At Christ Church, St. Marylebone, certain alterations and improvements are to be carried out, consisting of the construction of a side chapel at the east end of the north aisle for week-day and occasional services, and the construction of a porch and entrance at the north-west end of the church. The side chapel will be screened off from every part of the church except the north aisle. The estimated cost of the alterations is about £250.

Liverpool Cathedral.—The executive committee of the Liverpool Cathedral Committee, accompanied by the Lord Mayor (Alderman C. Petrie), visited the Walker Art Gallery on Thursday last and inspected the drawings and designs submitted by architects desirous of taking part in the final competition. On Monday and Tuesday they were on view to the members of the general committee, members of the Liverpool Architectural Society, and the press, and to-day, Thursday, Friday and Saturday, in consequence of the number of requests received by the committee, the public will be allowed to inspect the drawings. Next week we shall publish a criticism of them.

A New Village Hall at Llanhaiadr, Denbighshire, has just been completed. The site was originally occupied by an old market building. The present building comprises a market hall on the ground floor, with large assembly hall and ante-room upstairs. It was erected by Mr. R. A. Jones, of Llanfyllin, from designs by Messrs. E. Bremner Smith & Bremner, architects, of London and Oswestry. Red Ruabon bricks have been used, with red roofing tiles on the roof, the windows glazed with leaded cathedral lights, and all the woodwork of pitch-pine. The heating is on the low-pressure system, by Mr. R. J. Roberts of Oswestry; ventilation by Boyle's system.

The Disaster at All Souls' Church, Langham Place: Verdict.—The inquest upon the body of the Canadian lady who was killed by the fall of a piece of the balustrade of All Souls' Church, Langham Place, was concluded on Friday last. The jury found that the death was purely accidental, but they considered that sufficient care was not exercised in fixing the flag rope. They were also of opinion that the authorities, either the London County Council or the Borough Council, should exercise supervision in the case of all decorations erected upon any occasion. In the course of the evidence Mr. A. Ashbridge, district surveyor, of Upper Baker Street, said that 11ft. of the coping had given way. He discovered two defects in it, the result of the action of time and weather—defects that might not have been externally visible. The coping-stone was part of the original building, which was completed in 1824, and in 1895 it had been faced with metallic cement. His conjecture was that the gust of wind uplifted the coping stone from its bedding. Prof. Beresford Pite (named in the newspapers as Mr. Arthur Beresford Pytle!), consulting architect to All Souls' Church, described the condition of the stonework of the balcony as good, and said he was not of the opinion that any danger was to be anticipated when the rope was put across the street. One may assume, therefore, that stonework is in a good condition when it can be broken with ease between the fingers!

A Limited Competition for a New Parochial Hall and Institute in connection with St. Martin's, Potternewton, Leeds, was recently held, and the design of Mr. Percy Robinson, architect, of Leeds, has been selected.

The New Church of St. Werburgh, Chorlton-cum-Hardy, was consecrated last week. Seating accommodation is provided for 800 worshippers. The architect was Mr. R. Basnett Preston, A.R.I.B.A.

The Rebuilding of the Old Bailey.—At last Thursday's meeting the Court of Common Council adopted the recommendation of the County Purposes Committee that a county rate of 2d. in the pound for the year ending September 1903 should be made for the rebuilding of the Sessions House, Old Bailey, and subsequently, at the instance of the City Lands Committee, the Court agreed to accept the tender of Messrs. Holloway Brothers to do the work for £282,000, including the cost of the demolition of Newgate. The highest tender received was £340,000. The estimate was £265,000.

St. Bartholomew's, Ashleworth.—The rector and the parishioners are much concerned about their fine old church, which is in danger from the proximity of the Severn. Last year there was more than 2ft. of water in the east end of the church. It is now proposed to erect a stone wall and earth banks, and, in addition, the churchyard is to be raised about 3ft. and the present system of drainage altered. The plans have been prepared by Mr. H. L. White, of Ashleworth, and the contractor is Mr. W. Wicks, of Maiseimore.

The Gordon Statue.—The statue of General Gordon, on its temporary pedestal in St. Martin's Place, Trafalgar Square, was unveiled on Friday last by the Duke of Cambridge. It is of bronze, and will eventually be placed on the pedestal which is waiting for it at Khartum. The late Mr. Onslow Ford, R.A., was the sculptor. Mr. Ford went down to superintend personally certain details on a black and bitter winter's day of the present year, and it was in the foggy damp of the foundry yard that he contracted, or at least developed, the chill which ended so swiftly in his lamented death.

Mr. Hornblower and the University College Hospital.—We are requested to state that the appointment of Mr. Hornblower as architect to University College Hospital, recently announced in the architectural journals, is not connected with the completion of the new buildings now in course of erection from the designs of Mr. Alfred Waterhouse, R.A. On the retirement of Mr. Waterhouse in April last, Mr. Paul Waterhouse was appointed, by resolution of the Hospital Committee, to carry these important buildings through to their completion, a selection which was confirmed by Sir J. Blundell Maple, Bart., M.P., the donor of the entire fabric.

Flatford Mill.—Last autumn, when Hogarth's house at Chiswick was in the market, everyone was anxious that so interesting a relic should be saved from destruction, but the attempted sale of Flatford Mill a few days ago appears to have attracted little or no attention among artists. Yet Flatford Mill, for which not a single bid was forthcoming at Tokenhouse Yard, is more intimately associated with the memory of Constable than the Chiswick House is with that of Hogarth. Constable spent his youth in and about Flatford Mill, which was the property of his father, and he has immortalised the building and its surroundings in some of his finest canvases.

Leeds and Yorkshire Architectural Society: Visit to Hull.—The members of the Leeds and Yorkshire Architectural Society recently visited Hull for the purpose of inspecting the Central Public Library in Albion Street (Mr. J. S. Gibson, F.R.I.B.A., architect). The party was received by Sir James Reckitt. Mr. Gibson wrote expressing his inability to be present and stating that the ceilings in the reference library and staircase were purposely designed to be decorated with figure painting and in colour. The visitors expressed themselves highly delighted with the reference room with its fittings of mahogany, inlaid with various coloured and expensive woods, and the finely-modelled ceiling. A visit was afterwards paid to Beverley Minster and St. Mary's Church.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
July 24	Aberdeen—Post Office	Commissioners H.M. Works, &c. .. .	Secretary, H.M. Office of Works, Storey's Gate, S.W.
" 24	Carmarthen—Boiler and Engine-house	Urban District Council	Joint Counties Asylum, Carmarthen.
" 24	Castleford—Repairing Roof	Rev. M. Sherrin, P.P.	W. Green, Surveyor to the Council, Castleford.
" 24	Fahan, Londonderry—School-house	Corporation	J. P. McGrath, 28 Carlisle Road, Londonderry.
" 24	Leigh, Lancs—Convent	Guardians	Tom Hunter, Bank Chambers, Leigh.
" 24	London, S.E.—Wards at Workhouses	Guardians of Southwark Union	Newman & Newman, 31 Tooley Street, S.E.
" 24	London, S.E.—Repairs to Infirmary	—	G. D. Stevenson, 13 & 14 King Street, E.O.
" 24	West Stanley, Durham	—	Secretary of Workmen's Club, Parker's Buildings, West Stanley.
" 24	Manningham—Furniture Depository	Co-op. Agricul. and Dairy Soc., Ltd.	C. E. Marsden, 3 John Street, Bradford.
" 24	Baileborough, Ireland—Creamery	Sewage Committee	T. M. Farrelly, Baileborough.
" 24	Bury, Lancs—Alterations to House	Llanwono School Board	A. W. Bradley, Borough Engineer, Bury.
" 24	Penrhwyceiber, Wales—School Alterations, &c.	Guardians of Union	S. Shipton, Clerk, Town Hall, Mountain Ash.
" 24	St. Olaves—Lunatic Wards	City Improvement Committee	Newman & Newman, 31 Tooley Street, S.E.
" 24	Hull—Dwellings	University Steam Coal Co., Ltd.	J. H. Hirst, Town Hall, Hull.
" 25	Senghenydd, Wales—Sixty Houses	—	J. H. Phillips, Olive Chambers, Windsor Place, Cardiff.
" 25	Workop—Villas	G. R. Burnett	A. H. Richardson, Victoria Buildings, Workop.
" 25	Nantyglo, Wales—Re-roofing	Urban District Council	Trinity Vicarage, Brynmawr.
" 25	Seascale, Cumberland—Gymnasium	Warkworth Harbour Commissioners	W. L. Mason, Architect, Kelsick Road, Ambleside.
" 25	Elland, Yorks—Refuse Destructor, &c.	—	Surveyor, Council Offices, Elland.
" 25	Cemble, Northumberland—Twenty-one Houses	—	T. Meik & Sons, 29 St. Andrew Square, Edinburgh.
" 25	Benwell, Northumberland—Eighteen Houses	—	Farthing & Dunn, 21 Pilgrim Street, Newcastle.
" 25	Huddersfield—Villa	—	Quarries, Longwood Edge.
" 25	Kilbride, Ireland—Alterations to Presbyterian Church	Social Club and Institute, Ltd.	Rev. R. Allison, The Manse, Kilbride, Doagh.
" 25	Langley Moor, Durham—House	Dairy Co., Ltd.	Social Club and Institute, Ltd., Langley Moor.
" 26	Castlecor, Ireland—Wall	Western Hebrew Synagogue	Castlecree Dairy Co., Ltd., Castlecor.
" 26	Celbridge, Ireland—Twenty-one Cottages	Rural District Council	B. S. Jacobs, Bowalley Lane, Hull.
" 28	Rugby—Hospital	Joint Hospital Committee	F. Shortt, Clerk, Celbridge.
" 28	Sowerby Bridge, Yorks—Offices	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
" 28	Westbury-on-Trym, Bristol—Chapel	Rural District Council	Manager, Gas Works, Sowerby Bridge.
" 28	Bristol—Hospital Extensions	Health Committee	La Trobe & Western, 20 Clare Street, Bristol.
" 28	Wolverhampton—Covered Market	Corporation	T. H. Yabbicom, 63 Queen Square, Bristol.
" 28	London, W.—Repairs	Central London Sick Asylums	G. Green, Borough Engineer, School Street Depot, Wolverhampton.
" 29	Southgate—Wood and Iron Footbridge	Urban District Council	Cleveland Street Asylum, Cleveland Street, W.
" 29	Leeds—Church	—	C. G. Lawson, Council Offices, Palmer's Green, N.
" 30	Bradford—Laundry, &c.	Co-operative Society, Ltd.	Rev. M. P. Davison, 65 Leopold Street, Leeds.
" 30	Giffach Goch, Wales—Extension of Schools	School Board	W. Rycroft, Bank Buildings, Manchester Road, Bradford.
" 30	Newhaven, Sussex—Repairs, &c.	Guardians of Union	J. Rees, Architect, Pentre, Rhondda.
" 30	Norden, near Rochdale—House	Water Board	H. Curtis Card, 10 North Street, Lewes.
" 30	Cross Gates—Station Buildings, Platform Roofing	North-Eastern Railway Company	J. Diggle, Hind Hill Street, Heywood.
" 30	Warehouse, Stationmaster's House and Cottages	—	W. Bell, Company's Architect, York.
" 30	Sheffield—Urinals	Health Committee	O. F. Wike, City Surveyor, Town Hall, Sheffield.
" 30	Manchester—Alterations	Parks Committee	City Architect, Town Hall, Manchester.
" 31	Manchester—Shed	Watch Committee	W. H. Talbot, Town Hall, Manchester.
" 31	Truro—Alterations	City Council	M. Lea, City Surveyor's Office, Truro.
" 31	Ealing—Lodge	Town Council	O. Jones, Engineer and Surveyor, Town Hall, Ealing, W.
" 31	Kensington—Alteration and Enlarging	Guardians	E. Flint, 80 Coleman Street, E.C.
" 31	Southampton—Telegraph Office	Commissioners of H.M. Works, &c.	H.M. Office of Works, &c., Storey's Gate, S.W.
" 31	Darlington—Houses	—	W. Y. Dixon, Estate Office, Baltic Chambers, West Hartlepool.
" 31	Treacastle, Brecon—Chancel, &c.	Vicar of Triangles	D. T. Isaac, Ruperra House, Brecon.
Aug. 1	Carlisle—Grand Stands, &c.	Race Stand Co., Ltd.	J. Graham, Architect, Bank Street, Carlisle.
" 2	Edenderry—Repairs	District Council	H. B. Waters, Civil Engineer, Edenderry.
" 5	Camborne—Erection and Completion of Residence	Urban District Council	H. W. Collins, Architect, Walseldon, Redruth.
" 5	Tottenham—Fire-Station Depot Buildings, &c.	School Board	W. H. Prescott, 712 High Road, Tottenham.
" 5	St. Stephens-by-Saltash—School Buildings	Co-operative Society, Ltd.	W. J. Carder, 8 Athenaeum Terrace, Plymouth.
" 6	Bradford—Store and Three Houses	Parish Council	W. Rycroft, Architect, Bank Buildings, Manchester Road, Bradford.
" 9	Merton, Surrey—Parish Offices	Rural District Council	H. G. Quartermain, Merton Park.
" 9	Yeovil—Dwelling-house	Union Guardians	No. 30 Kingston, Yeovil.
" 11	Chesterfield—Infirmary, Nurses' Home, &c.	New Crown Post Office	Rollinson & Son, 13 Corporation Street, Chesterfield.
" 12	Cahir, Co. Tipperary	Rev. Dr. Gaffney	H. Williams, Office of Public Works, Dublin.
" 15	Mullingar—College	—	J. J. O'Callaghan, 16 Nassau Street, Dublin.
" 16	Swadlincote Baptist Church—Enlargements	—	O. Coulton, 88 Oxford Street, Church Gresley.
ENGINEERING:			
July 24	Llanelli—Ventilation	School Board	School Board Office, Llanelli.
" 24	Bradford—Electric Lighting	Corporation	Electricity Department, Town Hall, Bradford.
" 25	Southborough, Kent—Pumping Station	Urban District Council	G. & F. W. Hodson, Engineers, Loughborough.
" 25	Londonderry—Heating	—	R. E. Buchanan, Engineer, Castle Street, Londonderry.
" 26	Smethwick—Tank, &c.	Gas Committee	V. Hughes, Engineer, Gasworks, Smethwick.
" 26	Rugby—Waterworks	Urban District Council	D. G. Macdonald, Surveyor and Waterworks Engineer, Rugby.
" 26	Glasgow—Main Drainage Works	Corporation	Office of Public Works, 64 Cochrane Street, Glasgow.
" 26	Rawtenstall, Lancs—Excavating, &c.	Corporation	A. W. Lawson, Borough Surveyor, Municipal Offices, Rawtenstall.
" 26	Huelva, Spain—Thirty Waggon	—	Secretariat of Port Works, Huelva.
" 26	Madrid—Framway Extension	Public Works Department, Madrid	Public Works Department, Madrid.
" 27	Azuaga, Spain—Electric Lighting	—	Commercial Intelligence Branch, Board of Trade, 50 Parliament St.
" 28	Sydney, Australia—Electric Cables, &c.	—	Deputy Postmaster-General, Brisbane.
" 29	Dublin—Subway	Lighting Committee	S. Hart, City Engineer, City Hall, Dublin.
" 29	Stratton St. Margaret, Wilts—Electric Lighting	Union Guardians	G. R. Peers, Engineer, Prince's Obssrs, John Dalton St., Manchester.
" 31	Stadthorpe, Yorks—Widening Railway	North-Eastern Railway Co.	W. J. Cudworth, Company's Engineer, York.
" 31	Ramsgate—Sea-Defence Works	Corporation	T. O. Taylor, Borough Surveyor, Albion House, Ramsgate.
" 31	London, S.W.—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.
" 31	Pontypridd—Electrical Cables, &c.	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
" 31	Hapton, Lancs—Electric Lighting	—	E. O'Shaughnessy, 66 Hammons Terrace, Padham.
" 31	Vigo, Spain—Water Supply	Urban District Council	Commercial Intelligence Branch, Board of Trade, 50 Parliament St.
" 31	Farnworth, Lancs—Engine, &c.	Rural District Council	J. D. Pember, Electricity Works, Albert Road, Farnworth.
" 31	Chilworth, near Guildford—Reservoir	City Council	F. S. Courtney, Broad Sanctuary Chambers, Westminster, S.W.
" 31	Leeds—Water Tanks	Electric Lighting Committee	City Engineer's Office, Leeds.
" 31	Truro—Electric Lighting	Lancs and Yorks Railway Co.	R. Dobell, Town Clerk, Truro.
Aug. 1	Crofton to Shafton, Yorks—Construction of Railway	Rural District Council	Engineer, Hunt's Bank, Manchester.
" 2	Dorchester—Waterworks	Main Sewerage Board	F. W. Mager, Civil Engineer, Aldridge, Walsall.
" 5	Richmond, Surrey—Motor Truck	King Electric Lighting and Cold Storage Co., Ltd.	Main Drainage Works, near Kew Gardens Station.
" 7	King William's Town, South Africa—Plant	Urban District Council	A. E. Booth & Co., 15 New Union Street, Moorfields, London E.O.
" 9	Bethesda, Wales—Waterworks Alterations, &c.	Rural District Council	D. G. Davies, Clerk, Bank Chambers, Bethesda.
" 9	Clown, Chesterfield—Sewer	Crown Agents for Colonies	E. Hazledine-Barber, Engineer, Hollin Hill, Clown.
" 21	Selangor, Malay States—Electrical Plant and Materials	Urban District Council	Crown Agents for the Colonies, Downing Street, S.W.
" 23	Malvern—Electricity Supply Works	—	H. P. Maybury, Engineer, Council House, Malvern.
Sept. 1	Valparaiso, Chile—Electric Tramways	Harbour Trustees	Chilian Consulate, 10 Lime Street, E.O.
" 4	Swansea—Hydraulic Accumulators, &c.	Mayor and Aldermen	A. O. Schenk, Harbour Offices, Swansea.
" 14	St. Petersburg, Russia—2 Bridges over River Neva	Ministry of Public Works	The Delegation Municipale, St. Petersburg.
" 15	Launceston, Tasmania—Electric Power Transmission Extensions	—	J. Terry & Co., 7 Great Winchester Street, E.O.
" 15	Cairo—Widening Canal	—	Inspector of Irrigation, Projects Circle, Minia.
" 30	Port Adelaide, South Australia—Harbour	—	Agent-General for South Australia, 1 Crosby Square, London.
IRON AND STEEL:			
July 26	Canterbury—Pipe and Gas Fittings	Gas and Water Co.	J. Burch, Secretary, Castle Street, Canterbury.
" 30	Amsterdam—Iron and Steel	—	M. Nyhoff, Bookseller, The Hague.
" 31	London, E.C.—Ironmongery, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.O.
" 31	Dewsbury—Cast-iron Pipes, &c.	Lighting and Water Committee	O. A. Craven, Gasworks, Savile Town, Dewsbury.
Sept. 1	London, S.W.—Rails and Fishplates	Municipality	Agent-General for Victoria, 15 Victoria Street, S.W.
No date.	Johannesburg—Manhole Covers, Columns, Joists, &c.	—	E. W. Carling & Co., St. Dunstan's Bldgs., St. Dunstan's Hill, E.O.

COMPLETE LIST OF CONTRACTS OPEN—*continued*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
PAINTING AND PLUMBING:			
July 24	Bury Lanes—Redecorating	Technical Instruction Committee	A. W. Bradley, Borough Engineer and Surveyor, Bury.
" 24	Llanely—Painting, &c.	School Board	I. W. Watkins, Clerk, Llanely.
" 24	Rotherham—Reglazing Roof and Leadwork	Corporation	J. Platt, Architect, High Street, Rotherham.
" 25	Nantyglo—Reroofing, Colouring and Cleaning Church	—	Vicar, Trinity Vicarage, Brynmawr.
" 26	Alltwen, Pontardawe—Painting and Colouring Chapel	—	J. Hinkin, Secretary, Dyffryn Road, Alltwen, Pontardawe.
" 28	Canterbury—Painting, &c.	Guardians	J. Plummer, 38 St. Margaret's Street, Canterbury.
" 28	Guildford—Painting, &c.	Corporation	C. G. Mason, Tuns Gate, Guildford.
" 28	London, W.—Painting	Central London Sick Asylum	Cleveland Street Asylum, Cleveland Street, W.
" 29	Epsom—Painting, &c.	Guardians	J. T. White, Master of Workhouse, Epsom.
" 28	Manchester—Limewashing	Guardians	A. J. Murgatroyd, 23 Strutt Street, Manchester.
" 30	London, W.—Painting	Borough Council	H. Mair, Borough Surveyor, Hammersmith.
" 31	Glasgow—Painting Works	Corporation	Office of Public Works, 84 Cochrane Street, Glasgow.
" 31	Llandudno—Paints, Oils, &c.	Urban District Council	A. Shelley, Town Offices, Littlehampton.
" 31	London, E.C.—Plumber and Gas Fitter's Stores, &c. . . .	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
Aug. 1	Cambridge—Painting	Market Committee	Borough Surveyor, Guildhall, Cambridge.
ROADS AND CARTAGE:			
July 24	Market Harborough—Paving and Roadmaking Works	Urban District Council	Coates & Johnson, Bank Chambers, Market Harborough.
" 24	New Barnet—Making-up	Urban District Council	H. York, Surveyor, Station Road, New Barnet.
" 24	Castleford, Yorks—Roadway	Urban District Council	W. Green, Surveyor to the Council, Castleford.
" 24	Denton, Lancs—Road and Street Works	Urban District Council	Geo. H. Newton, Surveyor to the Council, Town Hall, Denton.
" 25	Little Sutton, Cheshire—Lane Construction	Wirral Rural District Council	T. Davies, 34 Kingsland Road, Birkenhead.
" 25	Lewes—Materials for Paving	Town Council	Borough Surveyor, Town Hall, Lewes.
" 25	Sutton Coalfield—Making-up	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coalfields.
" 26	Rugby—Street Works	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
" 26	Colchester—Roadmaking	Drainage Committee	H. Goodyear, Borough Surveyor, Colchester.
" 26	Tredegar, Mon.—Limestone	Bedwelty Urban District Council	J. H. Lewis, Surveyor, Pengam, via Cardiff.
" 28	Barnet—Broken Granite, Gravel and Hoggins	Urban District Council	H. W. Poole, Clerk, Barnet.
" 28	London, S.W.—Street Works	Urban District Council	H. W. Longdin, Surveyor, Town Hall, Anerley, S.E.
" 28	Tonbridge—Materials	Urban District Council	W. L. Bradley, Surveyor, Tonbridge Castle, Kent.
" 28	Westbury-on-Trym, Glos—Roads, &c.	Rural District Council	A. P. I. Cotterell, 23 Baldwin Street, Bristol.
" 28	Carlton, near Nottingham—Sewers, &c.	Urban District Council	R. Whitbread, Station Road, Carlton.
" 29	Leyton—Kerbing, &c.	Urban District Council	W. Dawson, Council's Surveyor, Town Hall, Leyton.
" 30	Kilsyth, Scotland—Pavements	Town Council	J. T. Babbie, 180 Hope Street, Glasgow.
" 31	Ealing—Kerbing	Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.
" 31	Wanstead, Essex—Paving	Urban District Council	C. H. Brassey, Surveyor, Council Offices, Wanstead.
" 31	Baldon, Yorks—Limestone	Urban District Council	J. Bentley, Clerk, Baldon.
Aug. 2	Littlehampton—Steam Rolling	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
" 2	Littlehampton—Flints	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
" 6	Epsom—Making-up	Rural District Council	T. E. Ware, Surveyor, Waterloo Road, Epsom.
" 6	Hove—Granite Kerbing	Borough	H. H. Scott, Town Hall, Hove.
" 7	Wanstead, Essex—Granite Edge Kerb	Urban District Council	C. H. Brassey, Surveyor, Council Offices, Wanstead, N.E.
SANITARY:			
July 24	Wortley, Sheffield—Sewerage Works	Rural District Council	G. E. Beaumont, Holme Sea, Grenoside, near Sheffield.
" 26	Glasgow—Drainage Works	Corporation	Office of Public Works, City Chambers, 64 Cochrane St., Glasgow.
" 28	Billerica, Essex—Cesspools	Rural District Council	R. J. W. Layland, Surveyor, Billerica.
" 28	Goole—Scavenging	Urban District Council	Sanitary Inspector, Council Offices, Goole.
" 29	Llanely, Breconshire—Sewer	Brynmawr Urban District Council	D. W. Slocombe, Surveyor, Market Chambers, Brynmawr.
" 29	Brynmawr, Wales—Sewer	Urban District Council	D. W. Slocombe, Surveyor, Market Chambers, Brynmawr.
" 30	Chester—Sewers	Urban District Council	Knowles & Russell, 5 Castle Street, Liverpool.
" 30	Naas, Ireland—Sanitary Improvements	Guardians	D. J. Purcell, Presiding Chairman of the Workhouse, Naas.
" 31	Abingdon—Sewer	Corporation	G. Winship, Civil Engineer, Abingdon.
Aug. 9	Clown, Chesterfield—Sewer	Rural District Council	K. Hazledine-Barber, Engineer, Hollin Hill, Clown.
TIMBER:			
No date.	Birmingham—Timber	School Board	J. A. Palmer, School Board Office, Edmund Street, Birmingham.

COMPETITIONS OPEN.

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July 26	Clacton-on-Sea—Board School	—	C. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
Aug. 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	C. H. J. Talmage, Southchurch Road, Warnor Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 16	London, S.E.—Artizans' Dwellings	£100, £50, £40.	F. Ryall, Town Clerk, Bermondsey Town Hall, Spa Road, S.E.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.O. Offices, Tottenham.
" 29	Bideford—Municipal Offices and Public Library	£30, £15, £10.	W. B. Seldon, Town Clerk, 18 The Quay, Bideford.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad India.
No date.	Strathcona and S. Africa—Monument in Honour of Canadian Soldiers	—	P. Davidson, London and Lancs Buildings, Montreal, or Bank of Montreal, 22 Abchurch Lane, E.C.
"	Bristol—Reference Library	—	E. J. Taylor, The Council House, Bristol.

COMING EVENTS.

Friday, July 25.

CONFERENCE IN CONNECTION WITH THE NATIVE STUDY EXHIBITION at the Royal Botanic Gardens, Regent's Park, W. Prof. Lloyd Morgan on "Native Study in Elementary Schools." Lord Strathcona presides.

Saturday, July 26.

ARCHITECTURAL ASSOCIATION.—Fourth Summer Visit to view Church and Monastery of St. Francis, at Bocking Bridge, Essex, by the late Mr. J. F. Bentley. Members to meet at the main line booking-office, Liverpool Street, at 11.45 a.m. for the 12 o'clock train. Camera and Cycling Club visit with the ordinary Summer visit.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion to Houghton-le-Spring.

Wednesday, July 30.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion to Trinity House, Quayside, Newcastle, 6 to 9 p.m.

Saturday, August 2.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS (Newcastle-upon-Tyne).—Annual Meeting at 2 p.m. Council Meeting at 1.30 p.m.

Wednesday, August 6.

SANITARY INSPECTORS' ASSOCIATION.—Autumn and Provincial Meeting and Conference at Middlesbrough (First Day). Council Meeting in Committee Room, Municipal Buildings, at 6 p.m.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at Middlesbrough (Second Day). Reception by the President and the Mayor of Middlesbrough at 10 p.m. Presidential Address by Sir James Orichton-Browne, M.D., LL.D., F.R.S., at 10.30 a.m. Extraordinary General Meeting at 11 a.m. Mr. T. Fridgen Teale, M.A., F.R.S., on "A Short Sanitary Retrospect." Visit to Saltburn at 2.30 p.m.

Friday, August 8.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at Middlesbrough (Third Day). Sir James Orichton-Browne on "Malaria: Its Practical Bearing on Sanitation." Mr. George H. Anderson on "A Quarter of a Century's Sanitary Progress in Middlesbrough." Dr. J. Wright Mason, M.O.H., on "Port Sanitary Administration." Dr. Dingle, M.O.H., on "Infectious Diseases." 10 a.m. Garden Party in Albert Park at 2 p.m. Banquet in Town Hall at 6.30 p.m.

Saturday, August 9.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at Middlesbrough (Fourth and last Day). Conference resumes at 10 a.m. Excursion by Steamer to Sea at 11 a.m. and visits to Tees Floating Hospital for Infectious Diseases, South Gare Breakwater and Fifth Buoy Lighthouse.

INSTITUTION OF JUNIOR ENGINEERS.—Summer Meeting until August 16th.

Saturday, August 23.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Hartlepool.

CURRENT MARKET PRICES.

FORAGE.		£ s. d.	£ s. d.
Beans	per qr.	1 15 0	2 0 0
Clover, best ..	per load	4 15 0	5 10 0
Hay, best	do.	5 5 0	5 12 6
Sainfoin mixture ..	do.	4 10 0	5 5 0
Straw	do.	1 16 0	2 8 0

OILS AND PAINTS.

Castor Oil, French ..	per cwt.	1 5 9	—
Colza Oil, English ..	do.	1 6 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 13 0	2 14 0
Lead, white, ground, carbonate do.	1 4 10	—	—
Do. red	do	1 0 4½	—
Linseed Oil, barrels ..	do	1 9 9	—
Petroleum, American ..	per gal.	0 0 6½	0 0 6¾
Do. Russian	do.	0 0 5½	0 0 5¾
Pitch	per barrel	0 7 0	—
Shellac, orange	per cwt.	5 6 0	5 0 7
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 10 0	1 11 6
Tar, Stockholm	per barrel	1 2 6	—
Turpentine	per cwt.	1 12 6	1 13 7½

METALS.

Copper, sheet, strong ..	per ton	69 0 0	—
Iron, Staffs, bar	do.	6 15 0	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 10 0	12 0 0
Lead, pig, Soft Foreign ..	do.	11 7 6	—
Do. do. English common brands	do.	11 11 3	—
Do. sheet, English 3lb per sq. ft. and upwards ..	do.	13 5 0	—
Do. pipe	do.	13 15 0	—
Nails, cut clasp, 3in. to 6in. ..	do.	9 5 0	—
Do. floor brads	do.	9 0 0	—
Steel, Staffs, Girders and Angles	do.	5 15 0	6 5 0
Do. do. Mild bars	do.	6 10 0	7 0 0
Tin, Foreign	do.	129 0 0	129 10 0
Do. English ingots	do.	129 0 0	129 10 0
Zinc, sheets, Silesian ..	do.	22 7 6	—
Do. do. Vieille Montaigne ..	do.	24 10 0	—
Do. Spelter	do.	19 5 0	19 10 6

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel ..	per load	3 0 0	4 10 0
Pine, Quebec, Yellow ..	per load	4 7 6	6 0 0
Do. Pitch	do.	2 14 0	3 1 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle	0 8	—
Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0	—
Do. do. 4th & 3rd ..	do.	8 10 0	15 15 0
Do. do. unsorted ..	do.	5 12 6	6 10 0
Do. Riga	do.	6 15 0	12 10 0
Deal, Petersburg 1st Yellow ..	do.	18 5 0	—
Do. do. 2nd	do.	9 0 0	19 10 0
Do. do. White	do.	7 5 0	12 10 0
Do. Swedish	do.	8 15 0	16 15 0
Do. White Sea	do.	13 5 0	17 5 0
Do. Quebec Pine, 1st ..	do.	18 10 0	22 5 0
Do. do. 2nd	do.	22 5 0	—
Do. do. 3rd & 4th ..	do.	9 5 0	—
Do. Canadian Spruce, 1st ..	do.	7 10 0	12 10 0
Do. do. 3rd & 2nd ..	do.	9 0 0	9 10 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	7 12 6	10 5 0
Flooring Boards lin. prepared, 1st ..	per square	0 9 3	0 13 9
Do. 2nd	do.	0 10 6	0 16 2
Do. 3rd & 4th ..	do.	0 8 6	0 9 3

HARD WOODS.

Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, lin., Cuba ..	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 1½	—
Do. Tobasco	do.	0 0 5½	—
Elm, Quebec	per load	0 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0 0 4¾	—
Do. African	do.	0 0 4	—
Do. St. Domingo ..	do.	0 0 5½	—
Do. Tobasco	do.	0 0 3½	—
Do. Cuba	do.	0 0 5½	—
Oak, Dantzic and Memel ..	per load	3 15 0	5 7 6
Do. Quebec	do.	4 12 6	7 15 0
Tesl, Rangoon, planks ..	do.	16 0 0	17 10 0
Wainscot, Riga (Baulk) ..	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ..	per ft. cube	0 3 1	—

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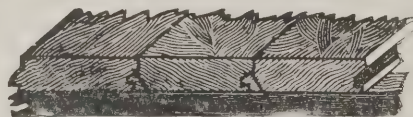
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17½ × 3 × 1½	6 10	6 3	9 6



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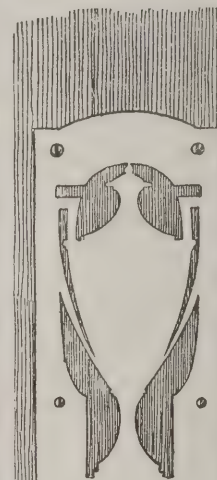
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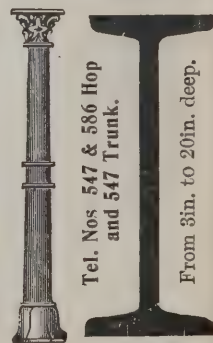
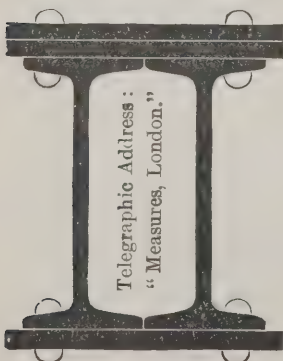
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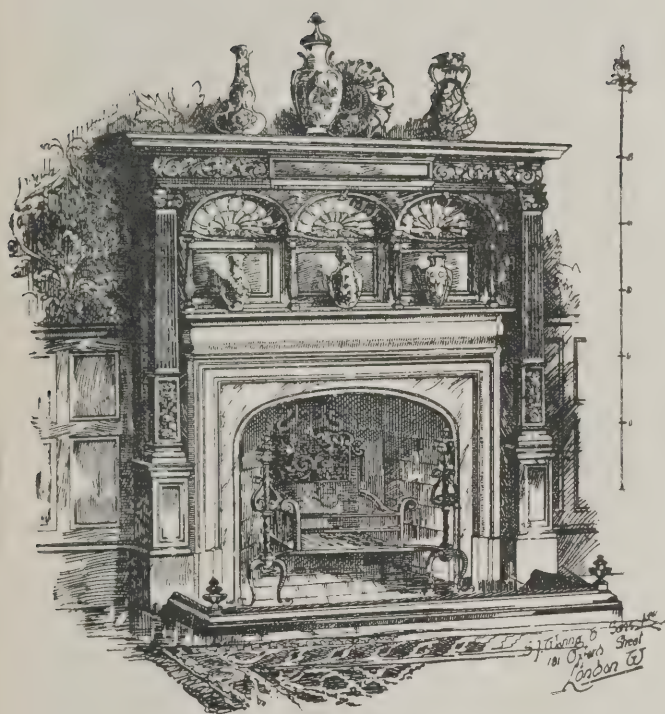
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Benjamin Watkins & Son, Ltd.

Registered to acquire the business of quarry proprietors and stone merchants carried on by Benjamin Watkins & Son at Gorsty Knoll, near Coleford. Capital £3,000 in £1 shares. Registered office: 33, Clarence Place, Newport, Mon.

Buck & Hickman, Ltd.

Registered to acquire the business of manufacturers of and dealers in engineering, mechanical and other tools, ironmongers, metal and general merchants, contractors, &c., now carried on at 2 and 4, Whitechapel Road, at 1, 2, 3, 4, and 6, Union Street, Whitechapel, and elsewhere, as Buck and Hickman, and to carry on the same. Capital £140,000 in £1 shares.

Plaster, Brick and Stone Co., Ltd.

Registered to acquire the businesses of Tipplers & Eaton, of London, the Wall Grange Brick and Tile Co., and the Froghall Stone Crushing Co., to adopt certain agreements and to carry on the business of manufacturers of bricks, pipes, earthenware, &c. Capital £25,000 in £1 shares. Registered office: 2, Cheapside, Hanley, Staffs.

Trent Contract Co., Ltd.

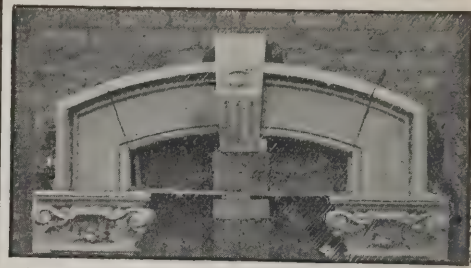
Registered to acquire and work any gypsum, limestone, marl, clay and other mines, quarries, &c., to deal in minerals and metals, and to carry on the business of manufacturers of cement, oils, colours, &c. Capital £7,500 in £1 shares. Registered office: 27, Chancery Lane, W.C.

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Registered to acquire and carry on the business of an artist in mosaics carried on by L. Schlenheim as Diespeker & Co. Capital £20,000 in £10 shares. Registered office: 57-60, Holborn Viaduct, E.C.

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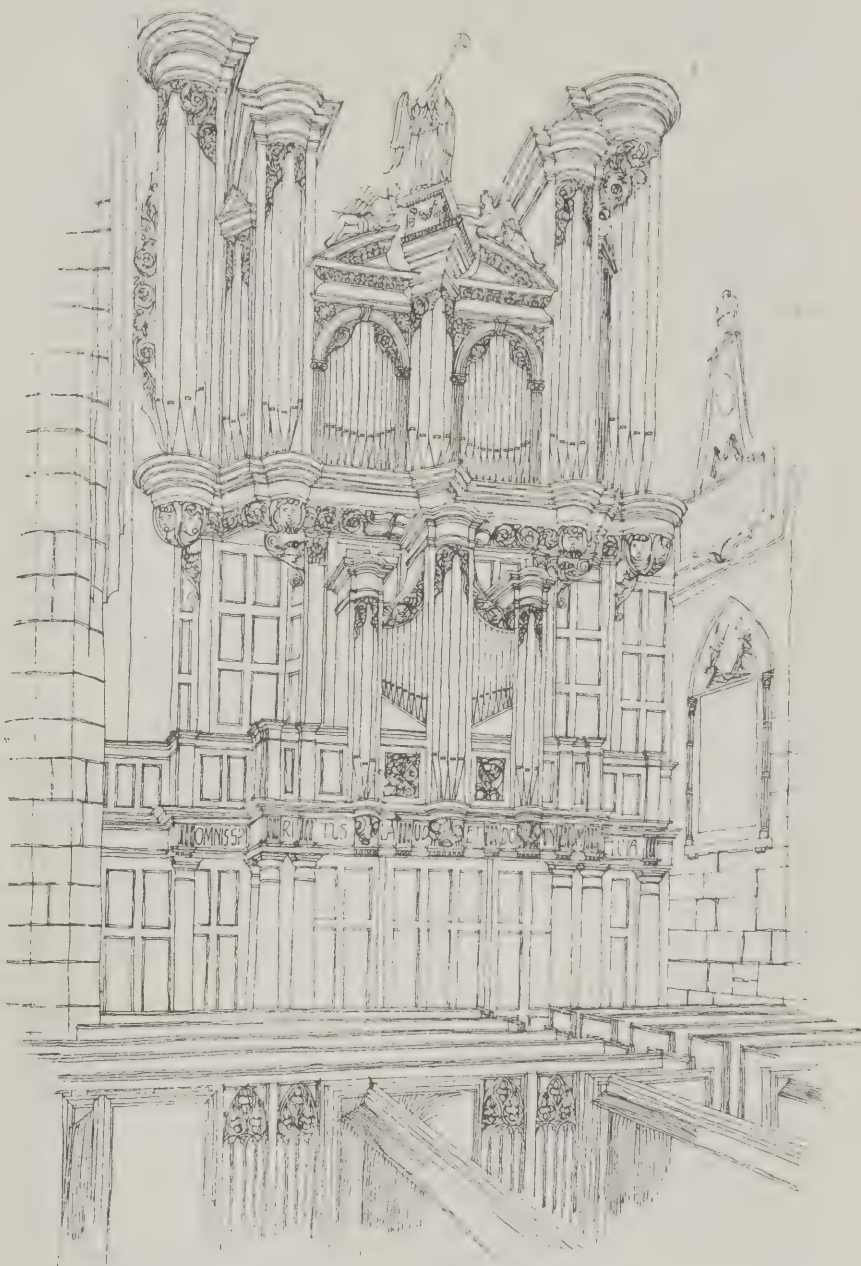
An Architectural Causerie.

Tenders. THE master-builders of Reading have a very just cause of complaint against the Committee of Management of the Royal Berkshire Hospital. It appears that tenders were invited in the usual way for alterations and additions to this hospital, but one of the highest tenders was accepted; and consequently the Master-builders' Association need an explanation. They contend that such action was unfair after giving several firms the trouble of pricing a large bill of quantities and taking their money as a guarantee, with apparently no intention on the part of the Committee to accept the lowest tender. Moreover, when the president of the Association requested an explanation, the Board of Management replied that they expressly stated they did not bind themselves to accept the lowest or any tender, that they failed to see how any firm had been prejudiced by their action, and that, therefore, they considered it quite unnecessary to publish the amounts of the tenders submitted. This is certainly a most unsatisfactory explanation. As the Association very properly point out, the usual clause disclaiming any liability to accept the lowest or any tender is always intended to give the employers power to reject the tender of any undesirable person or firm who may happen to send in a low tender. "It is not intended to give the right to reject every tender that may be sent, except the one highest in amount, or where would be the benefit of public competition? What responsible builder would tender under such conditions?" The Board of Management, however, have other views on the matter. But the arrogant manner in which they express these views is neither convincing nor in accordance with fair practice, and we think that a satisfactory explanation is due to the master-builders concerned.

A Staircase. THERE is a contractor who has carried sleight-of-hand (on a large scale) into the domain of building construction. He was recently building a dozen houses, each with a kind of underground kitchen which the local authorities required to be connected with the rooms above by a staircase. Now a dozen staircases are expensive, and it occurred to this enterprising contractor that it would be much more economical to have one only. So he bought a substantial staircase and fitted it up in the first house, got the local inspector to examine it, and obtained his certificate. The staircase was then removed to the second house, where another inspection took place, followed by another certificate, and so on through the whole twelve houses. In the last house the staircase was allowed to remain, but—*verb. sap.*—in the others its place was taken by a step-ladder!

Public Stairs. IN Italian cities there are few features more general than great monumental flights of public stairs in stone or marble. One of the best examples is in Rome; it breaks one side of the Piazza di Spagna and is famous for the artists' models who wait there in picturesque garb to be hired; the stairs are of yellow travertine stone, and harmonise with the quaint old fountain with basin, fashioned in the shape of a boat, immediately beneath it. Finely treated and combined with statuary, it is

either hand, Indian in treatment and decidedly effective. The place, however, where stately stairs would have been most effective is the northern bank of the Thames; what could be grander than a stately landing place, adorned with sculpture and appropriate ornament, with the broad current of the Thames at its feet, and gardens and buildings rising behind it? York Gate shows us how the designers of the Jacobean time treated the river, but there is only one attempt to break the long outline of the



ORGAN CASE, CATHEDRAL CHURCH OF ST. NICHOLAS, NEWCASTLE-ON-TYNE.
DRAWN BY R. P. S. TWIZELL, A.R.I.B.A.

always an illustration of "ornamented construction," and obvious even to the man in the street. London is not well endowed with such stairs, though the irregularities of its level might well have been utilised in this way. More could have been made of Trafalgar Square had "the steps" been treated with a little more imagination and love of the beautiful. The Duke of York's stairs and column are desperately commonplace; a certain simplicity is all that can be conceded them: we see indeed a symmetrical plan, rare in our capital, but it represents one of the lost opportunities of London: from this point Regent Street was to have been carried due north to Regent's Park, but one private residence stood in the way, and Nash was compelled to wheel his avenue of buildings into a quadrant. Crossing the Horse Guards Parade to the great block of Government offices beyond, we find a shallow flight of stairs beside the India Office; these have elaborately pierced panels of stone on

Victoria Embankment in any striking fashion, but the amount of success attained is moderate. An arch with the head and dripping beard of a water deity for its only ornament suggests nothing in particular, and is neither striking nor beautiful. Here and there leading to the Thames are old stairs which suggest Dickens's London, notably at the foot of Essex Street, but the general impression left by this, the finest part of the great city, is that a grand feature has been unaccountably omitted.

An Organ Case. THE accompanying sketch by Mr. R. P. S. Twizell, A.R.I.B.A., shows the organ in the cathedral of St. Nicholas, Newcastle-on-Tyne, after its restoration in 1882. The central portion only is old. The church itself is a plain fourteenth-century building, with the exception of the particularly fine Perpendicular lantern tower.

RECENT STREET ARCHITECTURE IN LONDON.—V.

BY F. HERBERT MANSFORD.

(Continued from p. 309, No. 386.)

UP to the present Bond Street has preserved its character as a thoroughfare of shop premises with narrow frontages; the Grosvenor Gallery is the nearest approach to a public building, and from end to end there is not a single "block" treated as an architectural whole. Among recent erections is "The Old Oak Tea House," which, however quaint within, is quite of our own time in outward aspect. A red and grey granite substructure, arched at the mezzanine level, supports a stone bay of two storeys. The bay rests closely upon

about 12ft. above the pavement, the corbelling-out being upon mouldings which contrive to die respectably. But the chief interest is centred upon the porch, with its Ionic columns of polished granite and rich carving above.

A little further east we get a reminiscence of a Florentine palace suggested by the rock-faced masonry, grilled openings and imposing cornice of Messrs. Standen & Co.'s new premises. Probably the architect had no intention to awaken such a memory or he would not have added the angle turret, much less have permitted it to break the skyline.

Leicester Square is being gradually transformed. On the south side the new premises of the Dental Hospital occupy a conspicuous but rather awkward site. The elevation is unfortunate inasmuch as the main entrance occupies a weak position on the curve, and the

constructed of granite, marble, stone, plaster, mosaic, oak and mahogany; its careful design could have been better realised in a less bewildering variety of materials. Above, the salt-glazed brick walling is broken by several oval windows and two lofty series of mullioned bays in stone, with carving of an original character, the whole being surmounted by a steep-pitched roof, gabled in all directions.

The narrow-fronted premises, No. 48, have been erected from the design of Messrs. Treadwell & Martin. It is well that this firm should have another opportunity in this locality, seeing that the well-known stone building which they designed to face down the Haymarket has been mutilated and painted. We see in Leicester Square their characteristic gable terminal striding the coping like a bell turret, and their usual sprightly carving. The mullioned windows are grouped in the centre of the elevation between masses of masonry treated turret-fashion and resting on corbels of carved heads. One must take exception, however, to the niggling way in which the lines of the string-courses above and below the windows, after dying into the projecting turrets, reappear on the other side for a few inches only. That an otherwise entirely stone façade should rest upon about 7ft. or 8ft. of brickwork would have been considered remarkable ten years ago, but the brickwork is glazed and may preserve the structure from the painter's brush or the hearth-stone of the caretaker.

In Cockspur Street are the new offices of the International Sleeping Car Co., occupying a site with three frontages. Their chief architectural feature is the large window arch of the end elevation—one which would have gained enormously if the openings of the angle turrets had been diminished in number and size. The details are of Gothic form but badly require the softening influences of our London climate.

Trafalgar Square will soon undergo important alterations in aspect: the opening-up of the Mall, the isolation of the National Gallery and the erection of new premises for the Canadian Pacific Railway Co. are all changes of the near future—changes which can hardly fail to be improvements. Meanwhile the façade of the Grand Hotel has been restored and its commonplace design revealed in renewed freshness. The management, however, have redeemed themselves somewhat in the erection of the Bachelor's Wing east of Northumberland Street. The connection between premises in one occupation upon both sides of a thoroughfare affords favourable opportunity for picturesque effect when the authorities consent. It is only right that when public thoroughfares are spanned, artistic considerations should be kept well to the fore. The bridge connecting the blocks of the Grand Hotel on either side of the street has evidently been most carefully considered in detail, and the thoroughfare has gained an interest it could not otherwise have attained. The broken curve of the bridge is conceived in a bold spirit and the elaborated metal casing, half Moorish, half Renaissance, suggests that the fear of fire acted as a stimulus rather than as a constraint to the designer.

It is impossible to overlook such an imposing structure as the Strand front of the Hotel Cecil. Granted that rents and accommodation were supreme factors of the design, we cannot but feel difficulties have been accentuated rather than overcome. It is to be regretted that the arched approach to the courtyard could not possibly come in the centre of the façade, but that surely does not justify the practical divorcement of a portion of the elevation from the general treatment in order to restore its symmetry. This shortening of the elevation made breadth more essential to pleasing effect than ever, but we find the whole front divided into bays by lean columns and pilasters on lofty pedestals and other devices which increase the already overpowering loftiness of the structure. The manner in which the entablature rakes over the semi-elliptical carriage archway is truly painful. Probably the planning and construction are all that can be desired, but it is unfortunate that so important a frontage in one of our leading thoroughfares should impose its pretentiousness upon an easily impressed public. When the Press describe this structure as being "in the Adam style," we wonder whether they



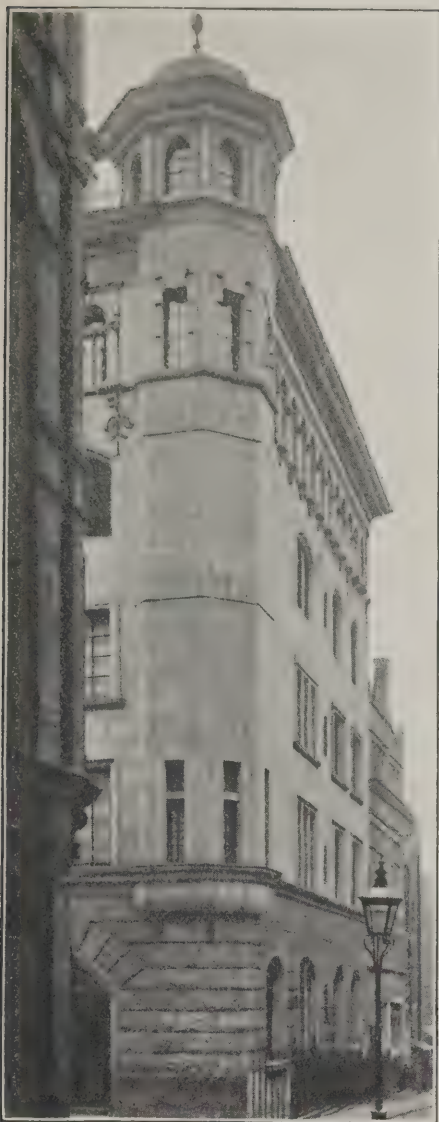
BRIDGE CONNECTING THE TWO BLOCKS OF THE GRAND HOTEL, CHARING CROSS, W.C.
WILLIAM WOODWARD, ARCHITECT.

the crown of the arch, which displays a deep reveal, suggesting strength equal to the occasion, while the flat soffit gives a strong shadow repeated by the cornice above. The piers of rubbed brickwork on either side of the bay give sobriety and strength to the façade, but make one regret more the narrowness of the piers below—a narrowness which is, of course, dictated by commercial considerations. Novelty is to be found in the rather plastic treatment of the masonry, both in the arcaded band and in the strips which, rising below, are carried through it to the cornice.

The Princes Hotel, Jermyn Street, presents two pleasing elevations in ashlar walling, with courses of carefully varied depths. A turret springs happily from the angle of the building,

numerous operating theatres above demand large areas of plate glass as remorselessly as a suburban draper. The ground-floor shops and mezzanine become the strongest part of the façade, framed in as they are by bold and deep arches of alternating brick and stone.

On the west side are two striking elevations, the larger of which is due to Messrs. Edmund Wimpers & Arber. The ground storey consists of three stone arches supported by piers of unpolished granite. These piers are of pleasing outline, but the eye would have been more satisfied with their capabilities if the varying levels of the bed joints had been avoided and each course formed of a single block. Perhaps it is intended to suggest the fact that the granite is but a casing to a stanchion. The entrance is



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REGINALD MORPHEW, ARCHITECT.

understand the qualities of grace both of proportion and detail which form essential features of Robert Adam's work.

In the elevations of the School of Economics, Clare Market, Mr. Maurice B. Adams has given us a mixture of Classic and Gothic detail suggesting that, after the battle of the styles, both can settle down fairly comfortably together even in one house, although the union can scarcely be said to preserve the best characteristics of either. The bold egg-and-tongue of the broken pediment above the doorway is close to delicate carving of a somewhat Gothic type. Ionic columns of equal girth are of unequal heights, but have in common a more than conventional diminution towards the capitals. Perhaps the whole design would have gained had one floor predominated, but we are left in doubt as to whether the ground or the first floor may be the more important. The position of the chimneys on the front parapet wall is presumably a necessity. The details throughout are interesting, and to those whose temperaments are pleased with novel combinations the general effect is probably satisfactory.

The addition to the Holborn Baths in Broad Street, St. Giles's, has been designed by Messrs. J. & S. F. Clarkson on the lines of the old façade in Endell Street, the chief modification being the omission of the heavy key blocks above the first-floor windows and the increased projection of the main cornice in order to preserve the proportions of a slightly higher elevation. This cornice is finished in cement, although all dressings are in stone—even in its freshness the

difference of colour and surface is not very apparent.

The new premises of Messrs. Stanford in Long Acre are rendered conspicuous by the gabled outline of the steep roof, which is in marked contrast to the pervading horizontality of the elevation beneath. Flat stone arches hung upon iron girders span the wide low openings of the various storeys. We see the same combination of cream-coloured stone and salt-glazed brick as at Messrs. Thurston's building in Leicester Square, a combination which may be hoped will become more general, for it is pleasing both in its warmth of colour and serviceability of surface.

(To be continued.)

PETERBOROUGH CATHEDRAL.

The Restoration Completed.

AT Peterborough last week thanksgiving services were held in celebration of the completion of the restoration of the famous west front of the cathedral, which, in Dean Farrar's opinion, is unapproached for grandeur, except possibly in the case of Amiens. The whole expense of the repair of the front has been about £13,000, of which sum the last £2,000 was raised as a memorial to the late Dean Ingram, to whose energy the successful prosecution of the work was largely due. The works still required to be done to ensure structural stability are the repair of the gable and east and west sides of the north transept, and the repair of the west side of the south transept, the estimated cost being £1,700.

The condition of the west front had long been a cause of anxiety. The whole portico was obviously out of the perpendicular, and had been so for centuries, as was proved by the adjustment of the great piers of the front to the porch and parvis erected between them in the latter part of the fourteenth century. Great cracks were visible in the work, both to the north and south of the part immediately supported by the piers. The north-western arch was distorted, and some of the stones composing it appeared to be loose and in danger of falling, while the whole front wore an appearance of dilapidation. But it was the damage done to the pinnacles of the flanking tower by the great storm of March, 1895, which made it imperative to proceed with the work of examination and repair. A scaffolding was erected in that year, and it was found that the two great piers were more than 2ft. out of the perpendicular, and that their subsidence was due to the insufficiency of their foundations, an ancient well being discovered close under one of them. The north-western arch was dislocated, and the gable above it was torn by a serious crack from front to back and was also split longitudinally. The gable over the south-western arch was also both cracked and split. The groining which covered the portico had been seriously strained, and when the dust and rubbish, which had accumulated on its upper surface to the amount of about 90 tons, had been removed, great yawning cracks were revealed. The work of repair, executed first under the late Mr. J. L. Pearson, R.A., and since 1898 under Mr. G. F. Bodley, R.A., has been of a most thorough character. The foundations of the two great piers have been strengthened and carried down to the limestone rock, and the well has been filled with concrete. The piers themselves have been repaired and strengthened, and metal ties have been inserted binding the west front to the main building. The central portions of the north-west and south-west arches and gables have been taken down and rebuilt, the facing stones in each case being numbered and replaced in their original positions, excepting in a few instances where they were decayed. In the north-west arch and gable, which was in the worse condition of the two, the whole number of facing stones was 2,006, of which 170 only (and these for the most part stones of an unimportant character) were replaced by new.

The central arch and gable has been repaired where necessary without being taken down. The whole of the internal masonry has been renewed, and the groining has been repaired and strengthened and its cracks carefully filled.

The flanking towers, with their spires and pinnacles, have been repaired; the north-west bell tower, the unfinished south-west tower, and the north and south gables of the western transepts have been repaired and pointed. The shafts ornamenting the portico, many of which were found to be of wood, have been repaired or replaced with polished Alwalton marble, and the western doorways of the north and south aisles have also been repaired. During the past twenty years £36,000 has also been spent on the repair of the fabric of the cathedral—including the rebuilding of the great tower—in addition to another £30,000 for internal fittings.

In the small edition of "Stones of Venice," Vol. I., p. 178, Ruskin says: "The noble example of the west front of Peterborough, which, in spite of the destructive absurdity of its central arch being the narrowest, would still, if the paltry porter's lodge or gatehouse, or turnpike, or whatever it is, were knocked out of the middle of it, be the noblest in England."



TEA-HOUSE, NO. 27, NEW BOND STREET, W.
CHARLES WORSLEY, ARCHITECT.



PREMISES OF THE INTERNATIONAL SLEEPING CAR COMPANY, COCKSPUR STREET, S.W.

Correspondence.

Two Competitions.

To the Editor of THE BUILDERS' JOURNAL,
LONDON, W.C.

SIR,—It may be of interest to your readers to learn that architects have been invited to submit designs in competition for the proposed new Wesleyan church and schools at Lorne Park Road and Lawson Road, Kirkley. From information received from the secretary of the Royal Institute of British Architects, who has been in communication with the promoters with the object of persuading them to revise their conditions, which were unsatisfactory, the Competition Reform Society has notified its members that they are requested to refrain from competing, in accordance with their agreement of membership. The principal points objected to were:—(1) No assessor and no guarantee to employ the author of the best design; (2) no premiums; (3) excessive amount of work asked for, inasmuch as roof and foundation plans, details of lighting and heating, details and complete specification are required; (4) competitors had to assure themselves as to correctness of site plan accompanying conditions.

The only points which were conceded by the promoters were (1) a premium of £10 was offered, and (2) the drawings might be drawn to $\frac{1}{4}$ th or $\frac{1}{8}$ th scale, at the option of the competitor.

With reference to the proposed Municipal Offices, Library, &c., at Bideford, the Society has received information that certain alterations have been made in the conditions, especially with regard to the appointment of an assessor, which is now definitely agreed upon. The attention of the promoters was also drawn to other details which it is understood will be submitted to their committee.—Yours truly,

HENRY A. SAUL,

Hon. Secretary, Competition Reform Society.

[It is satisfactory to see that the action taken in regard to these two competitions has proved so salutary. Much good will result by the continual supervision by professional bodies of the conditions of public competitions for architectural works—much good, indeed, has already resulted—and a certain stigma removed from a system which, though some may object to it *in toto*, is the common one adopted to-day.—ED. B. J.]

THE FALLEN CAMPANILE.

*Ah, the clear morning! I can see St. Mark's;
That black streak is the belfry.*—BROWNING.

THE work of clearing away the ruins of St. Mark's Campanile, Venice, is proceeding satisfactorily under the supervision of Signor Boni. On July 22nd the workmen found the big bell named the Marangona, and also the bronze doors and two fingers of the statue of Mercury belonging to the Sansovino Library.

The Story of Vendrasco.

The story of Luigi Vendrasco, the man who long predicted the catastrophe, is an interesting and instructive one. Vendrasco was a master-mason, who since 1838 has been, with few interruptions, an inhabitant of Venice. In 1878 he was appointed to take part in the works on the Doges' Palace, and though not officially connected with the Campanile he devoted great attention to it. His technical knowledge convinced him that unless proper measures were taken for increasing the stability of the tower it was destined to fall. He therefore addressed outspoken reports to the Mayor and the Prefect of Venice, to artistic committees, and to King Humbert and Queen Margherita, begging them to intervene to save the tower. As this produced no effect he addressed an appeal to the late Queen Victoria, and drew on himself the anger of Signor Baccelli, then Minister of Public Instruction, who ordered him to remember that he was an Italian and not an Englishman.

In 1892 he began a campaign against the officials who were anxious to construct a lift

inside the tower, and in 1898 made such violent attacks on those responsible for its preservation that Signor Baccelli ordered him to go to Sardinia as a punishment. As Vendrasco refused to obey he was turned out of the service without compensation, though seventy-seven years of age. Remaining at Venice, he continued his campaign on behalf of the tower, but no one listened to his prophecies. A day or two before the catastrophe he became unusually disconsolate, and declared the fall to be imminent. At four o'clock on the morning of the fall he went into the Piazza San Marco, and, climbing on to the roof of the Basilica, examined the tower carefully with a field-glass. Then returning home, he wrote: "The Campanile can only live a few hours at the most, but it may also collapse



ENTRANCE PORCH, PRINCES HOTEL,
JERMYN STREET, W.

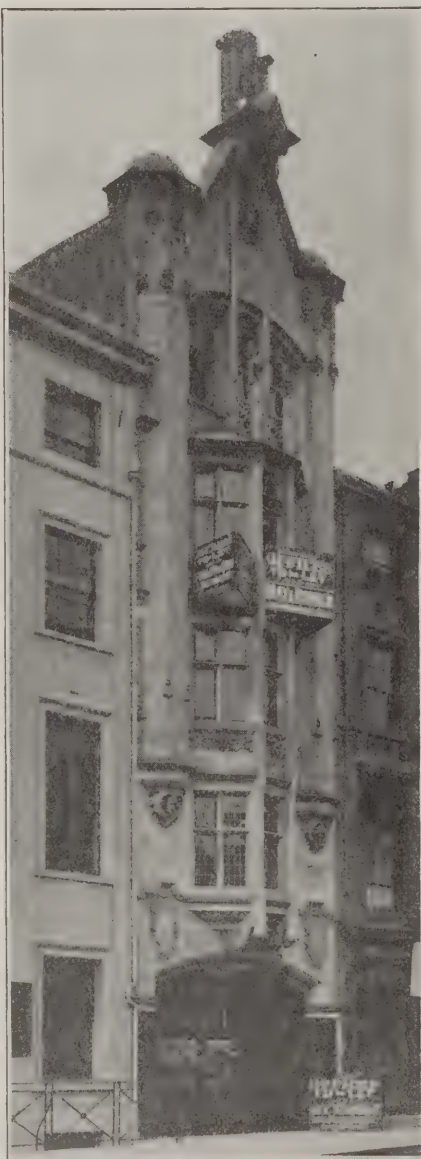
within an hour." He had hardly finished his report when the shouts of the people announced the fulfilment of his predictions, and his friends rushed in to tell him the news.

Vendrasco is of opinion that if the restoration had been taken in hand in 1892 the tower might have stood for centuries to come.

It is stated that the materials of which the Campanile was composed can be used in large part, and if this is done the reconstruction will not cost more than £120,500. The reconstruction can be completed in five years.

An Example of Venetian Reparation.

As an example of the ignorance of the men who were supposed to be "caring for" the preservation of monuments in the Venetian region the "Secolo" quotes the following episode. Some time ago it was found that the Loggetta of Sansovino at the base of the Campanile needed some repairs. A scaffolding was erected, and it was found that some blocks of marble were cracked and spoiled and needed to be replaced. While this was being done it was noticed that other decorative blocks were out of the square, and the repairers, believing that Sansovino had made a mistake, removed these also and replaced them by others mathematically square. It was then seen that the Loggetta began to divide itself into two parts and threatened to fall half towards the clock tower and half towards the Grand Canal. On examining the blocks which had been removed it was found that Sansovino, who understood the art of perspective, had cut his blocks out of the square in order that when regarded from a distance they should have the proper effect. It became necessary to make new blocks on Sansovino's model and to substitute them for the new square blocks.



NO. 48, LEICESTER SQUARE, W.C.
TREADWELL & MARTIN, ARCHITECTS.

The Preservation of Italian Monuments.

Signor Luca Beltrami, the eminent Milanese architect, who has earned the gratitude of his fellow citizens by restoring the Sforza Castle at Milan, declares the façade of the Oertosa at Pavia to be in such a state that repairs are urgently needed to repair a collapse. He says, moreover, that the difficulty of preserving Italian monuments comes from their great age, but still more from the maladministration of the funds voted by Parliament for their preservation and to the incompetency of the commissions appointed to decide on repairs. Anyone, be he printer or painter or photographer, is thought to be good enough to receive the fees for serving on a commission provided that he be a *protege* of the Ministry of Public Instruction. Fortunately at Venice the present Minister, Signor Nasi, has superseded the Regional Bureau for the preservation of monuments by placing it temporarily under the control of Signor Boni. This means that inspection will be thoroughly done, and that if any other monuments are in danger steps will be immediately taken to save them.

Who was to Blame for the Collapse?

On page 362 of our last issue we published some observations made by Mr. A. Robertson in Venice on the fall of the Campanile. In reply to the question "Who was responsible?" Mr. Robertson says:—The engineer of the Campanile is Signor Saccardo, who is the engineer of St. Mark's Church. But Signor Saccardo is not the engineer in charge of the "marble hall," the "Loggetta" of Sansovino. That is under the charge of the authorities who take care of other national monuments in Venice. These authorities in repairing the Loggetta roof cut into the Campanile as one might cut into a tree they intended to fell, and this they did without consulting Signor Saccardo. Had the Campanile been in good condition the cutting would have had no effect upon it, but as things were it was the last straw that broke the camel's back.

There are too many masters in Italy. The idea of two monuments built against each other, like the Campanile and the Loggetta, being under different authorities who work independently of each other! In Venice, indeed, there are five different sources of authority in regard to such monuments—namely, the authorities of St. Mark's, the authorities for the care of monuments, the Belle Arti authorities, those who have charge of Public Works, and the Committee of Vigilance. Then there is a sixth, the artists, who often make their voices heard in favour of not disturbing the old worn time-eaten face of things, and who sometimes hinder external renovation.

At the opening of the annual conference of the Royal Archaeological Institute at Southampton last week the members passed a vote of sympathy with the people of Venice and the Italian nation on the loss sustained by the fall of the Campanile.

It was stated that the monumental clock tower of Santo Stefano on the piazza of St. Mark showed signs of collapse. Several large cracks have appeared, and the authorities have ordered immediate measures of precaution to be taken. The belfries of Pordenone and Ivrea also show signs of instability, while at Rome timely attention has been directed to the danger threatening the elegant Campanile of San Silvestro. This church adjoins the General Post Office, and its Campanile, erected in 1200, has been utilized as a support for an enormous junction of telephonic and telegraphic wires. In high winds the strain upon the structure is tremendous.

Although it is suggested that portions of the fallen Campanile may be utilised in the work of reconstruction, much of the wreckage is naturally absolutely valueless. The debris is being removed in barges out to sea, and is disposed of by being thrown overboard.

Action by the Technical Committee.

The Technical Commission presided over by Signor Boni have inspected the buildings in the Piazza and have ascertained that each pillar of the old arcades (*procuratie vecchie*) supports a weight of about 3,500 kilos., or 300 kilos. per sq. centimetre, which is the maximum limit a pillar can carry. In order to stop the subsidences and cracks, it is indispensable to strengthen the wooden, metal, and mural supports ignorantly weakened or cut out by the proprietors, and

not to allow any further wounds to be inflicted on the pillars and columns. The Commission advised the lightening of the rooms containing excessive weights to reduce the pressure on the pillars within the limit of perfect safety, and they consequently ordered the removal of all statues and heavy furniture collected in the halls of the Salvati Jesurum Co., and also of the archives belonging to the General Insurance Co. The Commission then examined the clock tower, and found that the whole weight is borne by the pillars. There is no apprehension for its safety, but the pillars should not be tampered with in any way. With regard to the Doges' Palace, the immediate transfer of the volumes of the St. Mark's Library to the Zecca

together, exposed as it was to unusual pressure, and shaken by thunderbolts and earthquakes, must have undergone a slow but continuous process of disintegration in its general structure, and of actual fracture in some places, with the result that it was reduced to a condition of precarious stability. . . . We need not believe that the causes of this catastrophe are even partly to be sought for in the foundations, even admitting that these may have been disproportionate to the mass which they so long supported. Had there been any kind of movement in the foundations, it would have been evidenced by a disturbance of equilibrium in the building before and during the catastrophe itself."



HOTEL CECIL: STRAND FRONTAGE. JOSEPH SAWYER, F.R.I.B.A., ARCHITECT.

building, and the removal of the statuary collection of the museum, were ordered. The arches in the corner of the Sansovino's old library were strongly propped up, and the frontage demolished by the fall of the Campanile was temporarily covered by woodwork to prevent the Veronese frescoes on the ceiling from being damaged by the dust and the weather.

A Statement by Signor Beltrami.

In the R.I.B.A. Journal for July 26th is an article on the Campanile by Signor Beltrami, the distinguished Italian architect and director for the Conservation of Monuments in Lombardy. He says: "In spite of there being no records or drawings of the original plan, we are driven to the conclusion that the height originally contemplated by the builders of the ninth century can have been but little lower than that which was eventually attained in the early part of the sixteenth century and which remained unchanged until the last few days. . . . The mass of masonry, erected without any special precautions in the way of binding the materials

KING'S COLLEGE EXAMINATIONS.

THE following is the result of the examinations held in connection with the Evening Department of Architecture and Building Construction at King's College, London (names in order of merit):—

Building Construction.—Silver medal and £3 in books, A. Norton; bronze medal and £2 in books, R. C. Foster; £1 in books and certificate of distinction, E. L. Hampshire; certificate of distinction, E. H. Gates, C. A. Vardy, A. E. Brooker, H. H. Whittington, P. M. Willcox; certificate of approval, J. L. Hodges, J. A. Meikle, P. B. Sands, A. F. Sigwarth, E. E. Davies.

Sanitary Construction.—Alderman Sir George Faudel Phillips's medal: E. H. Gates.

Constructional Drawing.—£3 in books and certificate of distinction, H. H. Whittington; £2 in books and certificate of distinction, E. L. Hampshire; £1 in books and certificate of distinction, A. E. Brooker; certificate of distinction, A. Norton, E. H. Gates, R. C. Foster;

certificate of approval, C. H. Welch, W. H. Judges, P. M. Willcox, J. Perkins.

Quantities.—£3 in books and certificate of distinction, C. H. Price; £2 in books and certificate of distinction, C. A. S. Vardy; £1 in books and certificate of distinction, C. H. Welch; certificate of distinction, F. Hartnoll, C. L. Hodges, W. H. Judges; certificates of approval, P. B. Sands, E. L. Hampshire, A. Norton, P. M. Willcox, E. H. Gates, J. P. Hodgson.

History of Architecture.—Silver medal and £2 in books, A. E. Brooker; bronze medal and £1 in books, E. L. Hampshire; certificate of merit, J. A. Gillett, N. Horsfield, A. L. Snow.

Architectural Sketching Class.—Bronze medal and £1 in books, H. B. Mackenzie; certificate and £1 in books, J. Horsfield.

Architectural Studio.—Gold medal and £3 in books, W. Nicholls; bronze medal and £1 in books, J. H. Byron.

Wood Carving.—Silver medal, H. S. Jones; bronze medal, G. J. Bridges; certificate of distinction, H. C. Grubb.

THE LIVERPOOL CATHEDRAL COMPETITION.

THE criticisms which the publication of the conditions of the Liverpool Cathedral competition evoked at the time have we think, been amply justified by the result, not only in the comparatively small number of competitors who have submitted portfolios for such an important building, but especially in the quality of the designs themselves. As our contemporary the "Liverpool Courier" remarks, "It is comforting to remember that the Committee reserved to itself the right to invite gentlemen other than those who have joined the preliminary competition to send in plans in that which is to ensue," and we agree that there are several architects whose names do not appear in the list of those who submitted portfolios whom we should like to see invited to compete in the final competition—for the sake of architecture—however much we should otherwise deprecate such a course.

The competitors in the present competition may be divided approximately into two main divisions—those who have submitted special designs for a cathedral for Liverpool, and those who have merely sent in specimens of drawings of their executed work—chiefly parish churches. We shall notice a few designs of each division which we consider more deserving of special mention than the remainder, but as a whole the work in both divisions is disappointing.

Of the former division of architects, the majority have garbed their designs in the Gothic manner and have taken advantage of the absence of particular conditions to suggest buildings whose dimensions would be impossible for the intended site; but in plan and treatment the great majority are more or less faithful replicas of mediæval cathedrals of various countries, and as such would become second *Truros*, i.e., at once the faithfulness and lifelessness of waxwork reproductions. No one design shows the successful working-out of a building to accommodate the particular present-day phases of religious life; and most of them exhibit instead the unsatisfactory attempted adaptation to modern religious requirements of a type of building designed for the purposes of five centuries ago. It will make our meaning clear to imagine the result of endeavouring to adapt the plan and treatment of an old coaching inn to the necessities of a modern railway terminus, or *vice versa*. It is one thing to make the best of one of our old cathedrals for present-day requirements, but it is quite another matter to build a new one upon the old model.

Of the second division of architects, the majority have also followed in the Gothic manner; but the buildings being chiefly parish churches, and therefore comparatively small, the defects referred to are less exaggerated and noticeable. Of these designs the most interesting are those by men who have best succeeded in breaking the chains of a blind copying of respectable precedent, and who—in a scholarly manner—have infused their own life and soul into their work. These designers seem to have had in mind a purpose for their buildings to

fulfil, and to have honestly aimed at devising a building for that purpose; and the result is proportionately more truthful and pleasing. But whether their success in designing a comparatively small building, such as a parish church, would follow them in the conception of a cathedral, the nature of this competition has failed to demonstrate. It is certainly our great regret that, assuming a competition of some kind were a necessity for the Liverpool Cathedral, the conditions have not been such as to enlist the interest and services of the general mass of architects. The erection of a cathedral is so great an undertaking that, upon wisely-drafted conditions, the preliminary submission of small-scaled sketch-drawings for a cathedral suited to a fixed site would have undoubtedly produced a far greater response than has been the result in the present competition; and the arbitrators would have been able to select those sketches which indicated the best ideas for development upon a larger scale in a final competition. This preliminary competition has, in our opinion, been so much waste of time and labour both of the competitors and of the arbitrators; for it is only in the second competition that designs for a particular cathedral to be erected upon a fixed site and to comply with definite conditions will be commenced, and this only by a few selected men—chosen upon data having no reference to the actual cathedral to be built in Liverpool—instead of by the general body of architects.

To refer to some of the designs in the first division:—

No. 2. A design, in the richest form of Gothic, submitted in the New York Cathedral competition. To attempt its execution in its true spirit, under present-day conditions, would be obviously an impossibility.

No. 21. One of the more Gothic of the 1885 Liverpool Cathedral competition designs.

No. 38. A design with an unusual plan, and having two central towers. The detail has individual character upon traditional lines, but the general effect of the whole design is somewhat unhappy.

No. 40. An extraordinary attempt to plan a modern cathedral, but scarcely a successful one. The treatment and detail remind one too much of a Crystal Palace.

No. 41. This is a design which one has seen before under the title of "A Nineteenth-Century Modern Cathedral," and is a fine effort to deal with the problem on its merits and to forget style. We regret that a few more chains of precedent had not been broken before the author of this design developed its conception.

No. 45. A design which, though largely influenced by Gothic tradition and owing much of its effect to powerful drawing, nevertheless has considerable vigour due to individuality.

No. 46. Two designs in traditional later Gothic manner, and showing much hard work and energy of the designer, which, if applied to the working-out of the problem upon its own lines instead of those of tradition, would probably have produced a better result. The diagonal setting-out of the western towers is certainly not pleasing.

No. 53. This is a really splendid study of plan and of the massing of the several parts of the structure; the church, whilst having good congregational qualities, is not devoid of religious mystery; the western tower is well contrasted with the central dome. The design is one of those in which the cramped nature of the intended site seems to have been ignored, but it is a grand conception well suited to a spacious site. Unfortunately the design in its treatment closely follows tradition, the author having only thrown aside the Gothic precedents to pick up those of Byzantium.

No. 68. A traditional early Gothic design with certain exceptional features which would, we think, undoubtedly mar the acoustics of the building without possessing any mitigating advantages.

No. 83. An honest attempt to work out the cathedral problem for present needs, without traditional fetters, and in the knowledge of modern construction. The design is at present somewhat crude, but it has distinct merit as a good nucleus for further development.

No. 85. This is a design in the manner which has come to be known as the Glasgow School and owes much of its interest to a certain quaint

and unorthodox detail and to the technique of the drawing. The design is otherwise upon ordinary mediæval lines.

No. 94. A well-drawn vigorous treatment of a large central dome surmounting a church upon a Greek cross plan. It is one of the few designs upon free Classical lines.

In the second division we may refer to the following portfolios:—

No. 20. A portfolio comprising many well-known works, such as St. George's Church, Stockport.

No. 24. The work of an architect who generally contrives to impart freshness and vigour into somewhat traditional forms.

No. 29. Some of the ecclesiastical work of an architect with apparently a somewhat pronounced love of ornament and dislike for plain surfaces.

No. 48. A should-be well-known piece of ecclesiastical work, happy in its interior treatment and having an exterior of some freshness and vigour. The drawings do not convey a rather charming colour scheme which we know the interior to possess.

No. 80. A collection of illustrations of works by an architect whose efforts are always scholarly and interesting, and who is fortunate in not being altogether bound by tradition.

The following is the official list of the names of architects who have sent in portfolios of drawings in the preliminary competition for Liverpool Cathedral:—

R. A. Briggs.	Hippolyte J. Blanc.
René Buyck.	De Mathelin.
Fred H. Dudley.	Basil Champneys.
E. Goldie.	W. J. Medcalf.
J. Dale.	John Bloore, jun.
Albert C. Capronnier.	R. W. Collier.
A. W. Crook.	Austin & Paley.
George Simmonds.	W. D. Caröe.
George Taylor.	W. J. H. Leverton.
F. R. Kempson.	A. Groethaert.
F. Billerey.	G. Wailesby Davis.
A. Colpoys Wood.	H. O. Corlette.
Sir Thomas Drew.	J. J. Creswell.
J. Brook, Son & Godsell.	J. Jeffery.
Robert W. Gibson.	Beresford Pite.
J. Robertson.	J. Burnet & Son.
Walter le Riele.	— M'Kenzie.
E. Dobbelaers.	C. Spooner.
O. H. Mileham.	Murray & Murray.
F. M. Simpson.	H. Beecroft Downs.
Alph. Gosset.	J. Honeyman.
E. Grayson.	Eastwood & Greenslade.
C. Demaeght.	Reed, Smart & Tappin.
G. P. D. Saul.	P. A. Robson.
J. Oldrid Scott.	M. Metdepinninghen.
C. A. Nicholson.	W. H. Bidlake.
H. A. Prothero.	W. Mackay.
W. H. Jewitt.	O. J. Anderson.
J. Coates Carter.	Hy. J. Price.
E. A. Heffer.	J. P. H. Cuypers.
A. H. Skipworth.	A. E. Street.
F. H. & J. Sparrow.	F. E. Butler.
J. A. Wilson.	F. Todd.
Charles L. Bell.	James H. Cook.
Cram, Goodhue & Ferguson.	O. E. Powell.
Edouard Ranaekers.	W. O. Bishop.
B. Ingelew.	M. Stark.
Colson, Farrer & Nisbett.	H. B. Carré.
Sir William Emerson.	B. M. Ward.
G. G. Scott.	W. B. Gleave.
C. V. Johnson.	H. K. Bromhead.
G. H. Fellows Prynn.	W. Boswell.
Gerald O. Horsley.	G. H. Shackie.
F. Walley.	Max Salusaulieu.
"Burgos."	Temple Moore.
E. P. Warren.	A. D. Sharp.
W. Woodward.	H. Wilson.
Leonard Stokes.	Reilly & Peach.
J. F. Doyle.	W. F. Tapper.
G. & I. Steane.	Goodwin S. Packer.
S. O. Herbert.	J. Atwood Slater.

Sir William Emerson Objects.

Sir William Emerson, writing to the "Times" in reference to the above list, says:—

"I beg to state that, if my design for this cathedral—submitted in the first competition some years ago—has been laid before the assessors in this second competition it is by an act of the committee unauthorized by me, and in opposition to my expressed desire.

"The committee asked me a year ago to send them my drawings, which were placed first in the previous competition. This I did. They then asked me to compete a second time, as the site was to be changed. This I declined to do, as I felt it was about as fair as to ask the winner of a race to compete a second time because the committee chose to change the shape of the cup.

"A month ago Sir William Forwood, the chairman of the committee, asked me to allow them to retain the drawings for a while, as the committee might wish to refer to them, though he stated they did not propose to place them

with those sent in for competition, as he understood I did not intend competing again. To this I replied:—

"That, if they were of any use to the committee, they might do so, but that I did not think it fair to compare my design, made on certain lines to meet extraordinary difficulties of surroundings and limitations of site, with other drawings prepared for a different and freer site, and without such limitations; and, as to competing again, I felt that, if architects are to be asked to expend a year's labour and money on such work, and then, when the most competent assessor of the time has placed a design first, the author of that design is to be forced to compete again on the ground that a certain time has elapsed, and the site been changed, I for one do not care to be a party to such proceedings.

"Had I been asked to prepare a fresh sketch and failed to satisfy the committee, a new competition would have been an entirely different matter; but I felt I should have had the first chance offered me."

"I say this, not only from personal feeling, but in the interest of the profession at large, to whom proper dealing in competitions, so long as architects have to take part in them, is a matter of vital importance."

Sir William Forwood's Reply.

In reply to the above letter Sir William B. Forwood, Chairman of the Executive Committee, says:—"This competition has not yet taken place; it will be limited to six or seven architects, selected from those who have first submitted designs of their ecclesiastical work as an evidence of their skill. The committee and their advisers, Mr. Bodley, R.A., and Mr. Norman Shaw, R.A., wished to have these drawings before them for reference in making their selection of the limited number of architects who will be invited to send in competitive designs for the Cathedral; and it was no injustice to Sir William Emerson to include his beautiful drawings among these—indeed, I gathered that this was his wish. I venture to hope that we may yet have his co-operation in the only competition which will take place of designs for our cathedral."

New Patents.

These patents are open to opposition until September 2nd.

1901.—Grinding Mills.—13,422. E. R. SUTCLIFFE, 91, Noble Terrace, Armley, Leeds. This invention relates to the combination of revolving beaters with a grinding chamber turning in the opposite direction and having a perforated periphery through which the ground material can leave the chamber when fine enough. In this way a very high speed is obtained.

Water-Closet Joints.—15,567. J. WEST, 289, Shalesmoor, Sheffield. The junction of the flushing pipe with the horn of the water-closet basin is made with a rubber sleeve having a central collar and coned ends, secured in position by a thin metallic socket. This is claimed to be a better method than using an outside rubber sleeve fixed with copper wire.

Brick Machines.—15,629. J. HAMBLET and J. SHENTON, both of the Eagle Engineering Works, West Bromwich, Staffs. This invention is described in the form of a double machine delivering bricks at both sides. The clay is fed down a clay cylinder, at the bottom of which is a sliding die-plate having, say, five moulds in two rows, in combination with two sets of plungers. These latter force the bricks down on a table below and then rise ready for the die-plate to move back.

Paint-removing Composition.—16,930. G. WILLOCK, 4, Craigmour Terrace, Ayr. This composition consists of glycerine 1 part, soft soap 4, lime shell 3, caustic soda 4, water 8. The lime is slaked in the water over heat and the soap added; these are boiled well and the glycerine and the soda are then added, one after the other.

1902.—Bolts.—11. H. R. J. DENTON, St. Mark's Foundry, Wolverhampton. The bolt

is of the ordinary type but its turned-up end falls between two projecting pieces on the base-plate which are perforated to allow a padlock to be passed through, thus locking the bolt.

Treads.—8,496. A. W. COOKSEY, A.R.I.B.A., 6, Adam Street, Adelphi, London. In moulding steps of artificial stone, strips of teak or other suitable material are inserted longitudinally to give a foothold.

Glue Pots.—10,458. O. D. WETMORE, 343, Englewood Avenue, Chicago, U.S.A. The glue is made and kept in a closed receptacle entirely surrounded by a water jacket, so that no crust can form, and is drawn off from a tap at the bottom. Stirrers are provided.

of water-closet cisterns. 16,357, CHESTER, construction of tanks. 16,495, TOLLEY, securing glass to metal or wood sash-bars or frames. 16,508, NOBIS & WENZEL, composition for use as concrete. 16,775, STUBBS, water-heating apparatus. 16,817, SCHLEUNING, ceilings. 18,719, STRÜBING, heat non-conducting material for building purposes and pipe coverings. 18,744, BLITZ, artificial marble. 20,054, MILLER, circular sawing machines.

1902.—3,380, EASTWOOD, raising and lowering blinds. 4,808, MACKENZIE (*Schwab*), bars or fasteners for doors. 5,909, JOSEPH, updraught cowls. 5,968, McELROY, lavatory basins. 7,232, FISKE, apparatus for facilitating the drying of bricks. 7,757, CARO & DOPFER, supporting



NO. 46, LEICESTER SQUARE, W.C. WIMPERIS AND ARBER, ARCHITECTS.

The following specifications were published on Thursday last, and are open to opposition until September 9th. A summary of the more important of them will be given next week. The name in italics is that of the communicator of the invention.

1901.—10,958, HURRY & SEAMAN, manufacture of Portland cement. 13,310, BARRACLOUGH, flushing cisterns for water-closets and urinals. 13,476, SAMM, saw sets. 13,787, ABLETT, Norwegian stoves. 14,061, DEAREN, detachable sash-line fastener. 15,112, BALDRY, cranes applicable for batter-trimming, foundation excavating, &c. 15,556, VERITY, springs and check actions for swing doors. 15,641, LAWRIE, self-acting arrangement for operating the valve

frames or trestles for mechanical workshops. 8,080, JEFFRES, clamp. 10,308, HODGES, metallic cord for window blinds. 10,852, FÖRSTER, means for increasing the resistance of fireproof floors. 11,310, FOLKERS & FOLKERS, sharpening saws. 11,459, STEWARD & WATSON, window-sash fittings. 11,513, BOSSERT & BOSSERT, strengthened concrete walls, roofs, &c. 11,583, IMPSON & JEWSON, concrete bricks.

New Church, Chorley Old Road, Bolton.—The foundation-stones of the new building were laid last week. The plan approximates to a Greek cross, with an inside width of 38ft. in the arms. Messrs. Potts, Son & Hennings are the architects, and Messrs. J. H. & G. Marsden the contractors.

THE NATIONAL COMPETITION OF 1902.

THE awards in the National Competition appear to have been made with greater discrimination than usual this year. Only five gold medals have been given, and three of these are unquestionably well-earned, while reasons may be adduced both for and against the other two awards. The examiners may be congratulated upon having again encouraged the subject of Historic Design, as they did last year, by awarding a gold medal to two excellent sheets of drawings of candlesticks, which show elevation plan and sections at various levels in a manner which is masterly and promises well for the student's success in life. The subject is of the greatest possible importance, and deserves every encouragement, since it is frequently thought by students an irksome business to prepare the required sheets. The gold medal given to the enamel from Birmingham was no doubt partly given with this intention, viz., to encourage effort in that direction, but one cannot help thinking that there are other drawings near which show both greater effort and greater attainment in the matter of design, for which the awards appear to be made, judging from the printed list. The gold medal awarded to the stencilled panel for a portiere is attractive in colour and likely to produce a plentiful crop of things next year with a similar aim, and this is unfortunate, since there is already visible a tendency to use the figure in a manner for which it is unsuitable, viz., for constant repetition as in a repeating pattern. An example of such a stencilled pattern is hung close by, the subject of which is taken from Tennyson's Sleeping Palace, which shows labour and talent absolutely thrown away. Stencil too does not need encouragement; the number of examples is very large, and some of them show great talent in design combined with a proper use of the process, while there are other forms of design not less useful and difficult to which students need attracting. The number of imitations of some of the gold medal works of last year show that the examiners have in their hands a cogent means of directing the efforts both of students and masters.

Architectural Designs.

But to turn to the subjects more nearly interesting the readers of this journal, the measured architectural drawings and architectural designs, of which the examiners say that the average quality of the work is poor. Several very useful sets come from Nottingham: a very good sheet of drawings of wrought-iron work, among which is a curiously badly-designed farrier's sign which shows that the old craftsmen were not always inspired; some excellent details of Risley School-house; and an almost equally excellent sheet showing details from Bromley House. A workmanlike set of drawings of the north porch of Wells Cathedral comes from Birmingham, with clever and intelligent small sketches of carving, a little conventional. In all these the full sizes of the mouldings are carefully drawn. A very pleasing elevation of the west door of Rochester Cathedral comes from Maidstone, accompanied by a sheet of details, including a perspective sketch of the same door, which must have taken an enormous time to do. A set of tinted drawings of the panelling of the Study, Culross, is sent from Greenock, which shows the inlay very well, but is entirely without constructive details and perhaps for that reason only receives a book prize. These are the best of the measured drawings. The planning of the design-subjects is generally simple and better than the elevations, in which a heaviness of treatment is often apparent. In a design for a boat-house from Birmingham the bricks are indicated of varying thickness, and the pillars of a verandah are wider than the wall on which they stand, with other solecisms. A pretentious design for a town hall with a good deal of sculptured decoration shows several very curious constructive features, such as the arrangement of the roof over the great hall, and the elevation does not express the plan. A market hall, which also comes from a metropolitan school, shows a very pleasing end elevation and carefully-considered details, but the side is not so satisfactory.

There are two designs for a royal memorial chapel. Of these the one from Nottingham is better in point of general proportion than that from Newcastle, but is over bare and the columns are too lanky. The only other design of an ecclesiastical character is a fussy design for a church which comes from Birmingham, rewarded by a book prize "in spite of faults of affectation," as the examiners say. The mechanical drawings are about up to the usual standard.

Metalwork.

The metalwork is for the most part extravagant, and shows over-contorted curves, obtrusive rivets and flat pieces of metal cut into strange shapes or repoussé coarsely, or, on the other hand, an ungainly stiffness and straightness of outline. Nevertheless there are several suggestive things. A table-lamp with a copper shade pierced with stencil-like designs, and backed up with coloured glass, suggests possibilities though not excellent in itself, and among the silverwork and enamels are some excellent drawings from New Cross which give the maximum of effect with the minimum of material. A sheet of scissors from Sheffield for which a bronze medal has been awarded shows ingenuity in many of the forms employed, but in several the usefulness of the object has been forgotten and shapes made use of which would gull the hand or be cumbersome. The quaint has on the whole been sought at the expense of the fitting. The enamels show considerable feeling for colour and for the mixing of translucency and opacity, and the drawings are generally workmanlike, but there seems to be no middle way between licence of curve and ungainliness. One is glad to see that there is a market in Birmingham for jewellery which has some claims to design.

Decorative Design.

In the section of decorative design including figures may be seen some very good schemes of colour, but the figures generally pose too much. The artifice of composition is not hid, and one feels the posed model in most of the subjects. The best come from the Polytechnic, Regent Street, and of these the most architectonic is a frieze of the Canterbury Pilgrims in which the horses play a great part. The figures are relieved against a dull blue background powdered with red spots and pale blue crowns, which are not obtrusive. The colour is perhaps a little over-gay, since if the background is to tell as anything but black the wall must be well lighted. The cartoons from Liverpool are poor and show a gold-medal student of last year taking a silver medal this year for much the same kind of thing. A screen from Birmingham with the outline incised and gilded, as is the background, while the rest of the wood is tinted in various colours, is successful from the point of view of decoration, but the conception of the Fates (which is the subject chosen) from any other point of view is unsatisfactory. A design for an alms-box with inlays of wood, bone and mother-of-pearl, from Edinburgh, is pleasing, though the mouldings lack refinement; and so are some inlays on a black ground coming from the Regent Street Polytechnic, though "New Art" curves are too apparent in them. A silver medal is well gained by a frieze for mosaic from Birmingham, in which pale groups stand at intervals against a background of sea across which is seen a line of purple mountains. The sky above is golden, with white clouds in long procession across it. The full-sized cartoon of a part is much less satisfactory than the sketch. Another design for mosaic from Manchester shows feeling for colour, but exceedingly weak design and drawing. A carved panel from Newcastle-under-Lyme is accompanied by a design in silhouette which shows how much better it would have looked in inlay. There is a very pretty and delicate piece of gesso from Hull, worked upon bird's-eye maple tinted, but one asks oneself how long it would retain the effect if not kept under glass. Other gesso designs are graceful, and there are one or two very good pieces of cut leather.

Modelled Design.

In modelled design the best work comes from Mount Street, Liverpool—a font with very charming little groups in the panels—an exhibit which is marred by the entire absence of consideration for architectural form. The Plymouth Technical School sends some well designed and

executed low-relief ornamental work. The tiles are good on the whole, and from Belfast comes an excellent design in two colours which repeats well. Another from Bradford Technical School founded on the water lily, which requires three tiles to complete the repeat and has four colours, is also good. The plaques and large panels are less successful, and some friezes in high relief show how unsuitable highly-glazed material is for such treatment. Perhaps the most astonishing award is that of a silver medal to a wall-fountain in the same ware which is an example of what to avoid in every sense. The specimens of pots and plates which accompany many of the drawings are most valuable and in nearly every case are better than the designs. Some of the painted plates and cups are very dainty, especially those from Burslem.

The designs for damask table-cloths and serviettes are not very satisfactory this year, with one or two exceptions. The scale is generally too large, and the lines are eccentric. There are some pretty little designs for woven silks from Bradford, and they and the printed muslins generally show a daintiness in colour which is almost *de rigueur* for such things. The latter are also often pleasing in design though too reminiscent of last year's success. The best came from Battersea and Chelsea. The printed silks and wallpaper are nearly always either too large or too finicking in scale—generally the former. The colouring is more successful than the design. There are no good carpets, but from Liverpool come some capital embroideries, and a gold medal has been awarded to a bed-spread from Battersea which reverses the usual rule, and is much more pleasing in the design than in the executed portion sent up with it. The lace is not so good as last year, but there are some dainty designs from Cork and Worcester. The black and white work is poor, and nearly all show an attempt to work to the examiners' likings, a very unhealthy tendency. The colour printing shows little promise; a greeting card for the Lord Mayor of Birmingham and some illustrations of animals, &c., from Liverpool, excepted. There are two excellent book covers with inlaid leather from Camberwell.

The modelling of ornament and from nature is about up to the average, and the figures from the life are frequently very good, e.g., the gold medal figure and others from the same school. Sometimes a want of proportion is visible, the feet being made too large and the legs either too long or too short, but on the whole this is one of the satisfactory classes. The painting from the life, on the other hand, is indifferent, and the oil still-life poor. The water-colour versions are better. It is curious to see that the "landscapes" are nearly all interiors; they have aimed at force and reached blackness. The sepia work and flowers from nature do not call for remark, nor does the stained glass. There are some very good studies of flowers treated ornamentally, and some excellent drawings of the same in ink, interpreted very intelligently, from Wolverhampton and St. Albans, the latter in sepia. There are also some carefully drawn hands from Sunderland and Liverpool and from Birmingham, the last drawn from the east, and the time sketches from life are very good on the whole, though sometimes out of proportion a little. These are all most valuable forms of study, and one is glad to see the students taking to them so well. The life drawings are fairly good but expressionless, and the results of the local personal examinations go to show that the most valuable possession which a candidate can have is decision of mind—knowing quickly what he can do and losing no time in making experiments.

One of the "lettering" candidates selected a sentence with which to fill a triangular space of so admirable a sense that it is worth while to close this notice by quoting it: "A work of art must not have the appearance of a reality, but of an idea. For our ideas are always nobler, more beautiful, and better able to touch the soul, than the objects they represent." Oh that painters and designers would recognize its truth and bear it in mind! A. W.

Mr. Goscombe John has just been commissioned to execute a marble statue of the King by the Coronation Celebration Committee of Cape Town.

Law Cases.

Birkenhead Town Hall Fire: Sir William Emerson's Award. — The long-standing difference between the Corporation of Birkenhead and the Liverpool and London and Globe and Royal Insurance Companies, in connection with the claim for damages by the Town Hall fire, has now been decided, and Sir William Emerson, the umpire, has given his award. The total claim of the Corporation was £22,273; but of this sum £6,173 was paid in respect of undisputed items some months ago. The substantial difference arose on the damage done to the tower and the bells, and the question resolved itself into whether the fire necessitated the pulling down of the tower entirely or not. In the arbitration proceedings the claim of the Corporation in respect of the tower and bells and rebuilding was put forward at £16,100, in addition to which interest was claimed. Much expert evidence was called on both sides, and in the result Sir William Emerson has awarded, in respect to the items under reference, that the total amount due to be paid to the Corporation in consequence of the fire, and in full satisfaction of their claim for damage, is £8,161; but he disallows the Corporation's claim to be paid any interest, and adjudges that the parties shall each of them pay their own costs, and shall each bear one-half of the fees and costs of the award.

Water for Swimming Baths.—The case of the *Barnard Castle Urban District Council v. Wilson* recently came before the Court of Appeal. The plaintiffs appealed from a decision of Mr. Justice Buckley holding that the supply of water to a swimming bath connected with the North-Eastern Counties School at Barnard Castle was a domestic supply, for which the plaintiffs were not entitled to charge a special rate. The plaintiffs were the local water authority for the district, and the school, which was one accommodating about 300 boarders as well as day boys, was a school not carried on for individual profit, any profit being added to the endowment. A swimming bath had been erected in connection with the school capable of holding 35,000 gals. of water, and the defendants, who were the governors of the school, claimed to have the bath supplied with water at the domestic rate. In support of the appeal it was argued that the supply to a swimming bath was not a domestic supply, and that even if it was the carrying-on of this school was a trade or business, and the supply to the bath was therefore for a trade purpose. Lord Justice Vaughan Williams, in giving judgment, said each case must be looked at with regard to its particular circumstances. Though he would not say that in some cases the supply of water to a swimming bath might not be a domestic supply, in the circumstances of this case it was not. The bath was used for the business purposes of the school and not for domestic purposes. Lords Justices Romer and Stirling concurred, and the appeal was allowed.

Architects in Cape Colony: Important Case against the Government.—The important case of *Ackermann and Anderson v. the Colonial Government* was recently heard in the Supreme Court of Cape Colony. In giving judgment Sir John Buchanan said:—In this action the plaintiffs, who are civil engineers and architects, sue the Government for work and labour done in connection with preparing certain drawings and designs for a new railway-station. It would appear that the Government, proposing to have an extension of the Cape Town Railway Station, and being unable to prepare plans from want of staff in their own department, wrote to the plaintiffs on January 11th, 1897, offering the work on the usual terms, viz., 2½ per cent. on the estimate for the drawing and the same for supervision and construction. This offer was at once accepted by the plaintiff Ackermann, who shortly afterwards took into partnership the other plaintiff, and these two gentlemen worked together under this appointment. The scheme proposed was estimated to cost about £170,000. While the plaintiffs were employed on the work the Government or some of the Government officials seem to have altered their minds, and told the plaintiffs to stop the work in progress and to submit a totally new scheme. This

found expression in scheme B, and here again, after a certain amount of work had been done, the Government seemed to be still unsettled as to what to do and, again, stopped the plaintiffs, who then set to work on scheme C, a gigantic scheme, doubling the frontage and involving very extensive alterations to other buildings. Mr. Price, the present General Manager of Railways, was away from the Colony at the time, but on his return he disapproved of the scheme, and put definitely on paper what he considered were the requirements of the Government. These specifications were approved by the Engineer-in-Chief of the Government, and upon this definite statement, for the first time made in writing, of what was required, the plaintiffs prepared scheme D, which, after modification, seems to have been approved by the traffic manager and Government officials. The original contract contemplated that the plaintiffs should complete the necessary drawings, for which they should get 2½ per cent., and afterwards should supervise the erection of the buildings, for which they were to get another 2½ per cent. Had this been done on scheme D, it is quite possible the plaintiffs might have been satisfied to let a good deal of their previous work go. However, owing to circumstances (a change of Commissioners and other reasons), the whole scheme was stopped. Nothing further was done, and as the plaintiffs had then performed a considerable amount of work, and were not required to complete the drawings of any one of the schemes, and would not be allowed the supervision of the erection of the buildings, they claimed for work and labour done on scheme A ½ per cent. of the estimate, £435; on scheme B ½ per cent. of the estimate, £1,430; and on scheme C the sum of £12,500, being at the rate of 1½ per cent. on the estimated cost of the scheme. On scheme D they also claimed at the rate of 1½ per cent. As to this scheme, the Government do not seem to dispute that the plaintiffs are entitled to some reward, and for the work they tender the amount which the plaintiffs claim, namely 1½ per cent., or £6,250, on the estimated expenditure. They have already paid £5,000 of that amount, and they tender the balance of £1,250. They, however, deny that they are liable to compensate the architects for anything done on the previous schemes, and rely a good deal upon the decision of this court in the case of *De Witt v. The Cape Canning Co.* The principle there is, that in the absence of any special agreement an architect employed to design a building is not entitled to remuneration for his plans unless the employer has approved of the same or in some way utilised them. Now, no doubt in this case the Government did not accept any of the previous plans, nor utilise in any way the plans prepared, but, from their conduct and from the statements made by their own officers, I think it must be taken as admitted that there was, at any rate, an implied contract that the plaintiffs would be paid for the work they were doing. We are unanimously of opinion that the plaintiffs are not brought within the principles of the case of *De Witt v. The Cape Canning Co.*, and that the circumstances of this case justified them in asking for compensation for the work they had done on the other schemes. The question then arises, To what extent are they so entitled to be paid? I think that the amount for all the work that has been done by the plaintiffs may be taken at from £8,000 to £8,500. The judgment we have agreed upon is that the work done should be estimated at £8,500, and judgment will be given for that amount, less the £5,000 paid on account. There is also an additional amount of £153.—Mr. Justice Maasdorp delivered judgment to a similar effect. He said that when scheme A was abandoned it might be said that the contract to that extent came to an end, but his Lordship held that the contract for the other schemes was still based upon the letter of January 11th, 1897, and therefore these schemes came into the same position, as far as the legal liability of the parties were concerned, as if they had been done under the first contract.—Mr. Justice Hopley concurred.—Judgment for the plaintiffs for £3,500 as payment for the work on all the schemes (exclusive of the £5,000 paid on account), and also for the £153, as tendered on items not in dispute, with costs, the plaintiffs to give up to defendants the plans.

Trade Discounts.—The case of *Ewart v. Levy* was recently heard in the City of London Court. It appears that a man named Thomas called at the premises of Messrs. Ewart & Son, Ltd., and said he wanted some geysers. Asked if he was in the trade, he said "Yes," being an engineer. A *pro forma* invoice was sent to him allowing the trade discount of 25 per cent. Some days afterwards the defendant called on Messrs. Ewart and also requested to see some geysers. He chose one and also a bath, which he wanted to be fixed in his house at Dulwich. Some correspondence followed, and in answer to a letter addressed to the defendant the plaintiff received a letter from Thomas expressing surprise "at the statement that you have sent my account to my customer, which is anything but a proper proceeding. Mr. Levy has not received it, and had he done so, would have returned it to you." The quotation to Thomas was for a geyser. There was nothing said about a bath. Then later Levy wrote, "I am in receipt of yours of yesterday's date with statement, which I return to you, and must refer you to the arrangement made with Mr. Thomas. I have never received the invoice of account from you." It was found that neither Levy nor Thomas was in the trade. The plaintiffs claimed £7 11s. 6d. being the balance of an account of £28 odd, of which they had recovered £20 10s. The jury returned a verdict for the plaintiffs, with costs.

UNIVERSITY COLLEGE PRIZES.

THE following is the list of awards made in the departments of Architecture, Municipal Engineering, and Civil Engineering and Surveying, at University College, London:—

Architecture.

(PROF. T. ROGER SMITH, F.R.I.B.A.)

FINE ART.—Donaldson Silver Medal: C. W. Kilner (Bury St. Edmunds).

CONSTRUCTION.—Donaldson Silver Medal: H. W. Chapman (London); 2nd prize, R. M. Hilton. Second Class: Kuo Tung (Pekin).

CLASSES MAINTAINED BY THE CARPENTERS' COMPANY.—MEASURING AND ESTIMATING. Elementary Class: prize, C. L. McDougal (London). Second Class: J. F. Willson (London). Third Class: D. Bradford (London) and H. Walker (London).—ADVANCED CLASS: prize, R. H. Mayhew (London). Second Class: J. W. Hutton (London) and S. G. Peartree (London). Third Class: S. M. Deacon (London), S. J. Durden (London), G. L. Green (London), W. H. Lamble (London) and B. Stapleton (London).

BUILDING CONSTRUCTION AND DRAWING.—Elementary Class: 1st prize, C. G. Blomfield (London); 2nd prize, F. T. Foxcroft (London); 3rd prize, W. H. Williams (London). Second Class: J. T. Vivian (London).—ADVANCED CLASS. 1st prize, F. H. Hodson (London); 2nd prize, H. W. King (London); 3rd prize, G. Wiggins (London). Second Class: L. A. Jarvis (London) and C. A. Sheppard (London).

Municipal Engineering.

(PROF. OSBERT CHADWICK, C.M.G.)

Certificates, 1*, H. E. Parker (Harrow Weald). 2*, H. Gana (Chili). Second Class: J. H. P. Bradford (Martock). Third Class: V. H. Chabot (Selhurst), K. T. Lomas (London) and N. E. M. Roxby (London).

Civil Engineering and Surveying.

(PROF. L. F. VERNON-HARCOURT, M.A.)

CIVIL ENGINEERING.—Prize: H. Wyndham (Dinton). Second Class: W. A. Colegate (London), G. A. Grimoldby (London), H. E. Parker (Harrow Weald) and N. E. M. Roxby (London). Third Class: V. H. Chabot (Selhurst), H. B. Simpson (London) and F. J. White (Ealing).

SURVEYING.—Prize: F. G. Helsby (Watford). Certificates, 2* *eq.*, K. F. Enhou (Pekin), W. A. Erlebach (London) and C. D. Sharp (Norwood). 5*, T. C. Linpao (Pekin). Second Class: L. W. Atcherley (London), L. W. Colman (Burgess Hill), W. G. Cooper (Finchley), R. E. Golden (London) and F. J. White (Ealing). Third Class: C. B. Chabot (Selhurst).

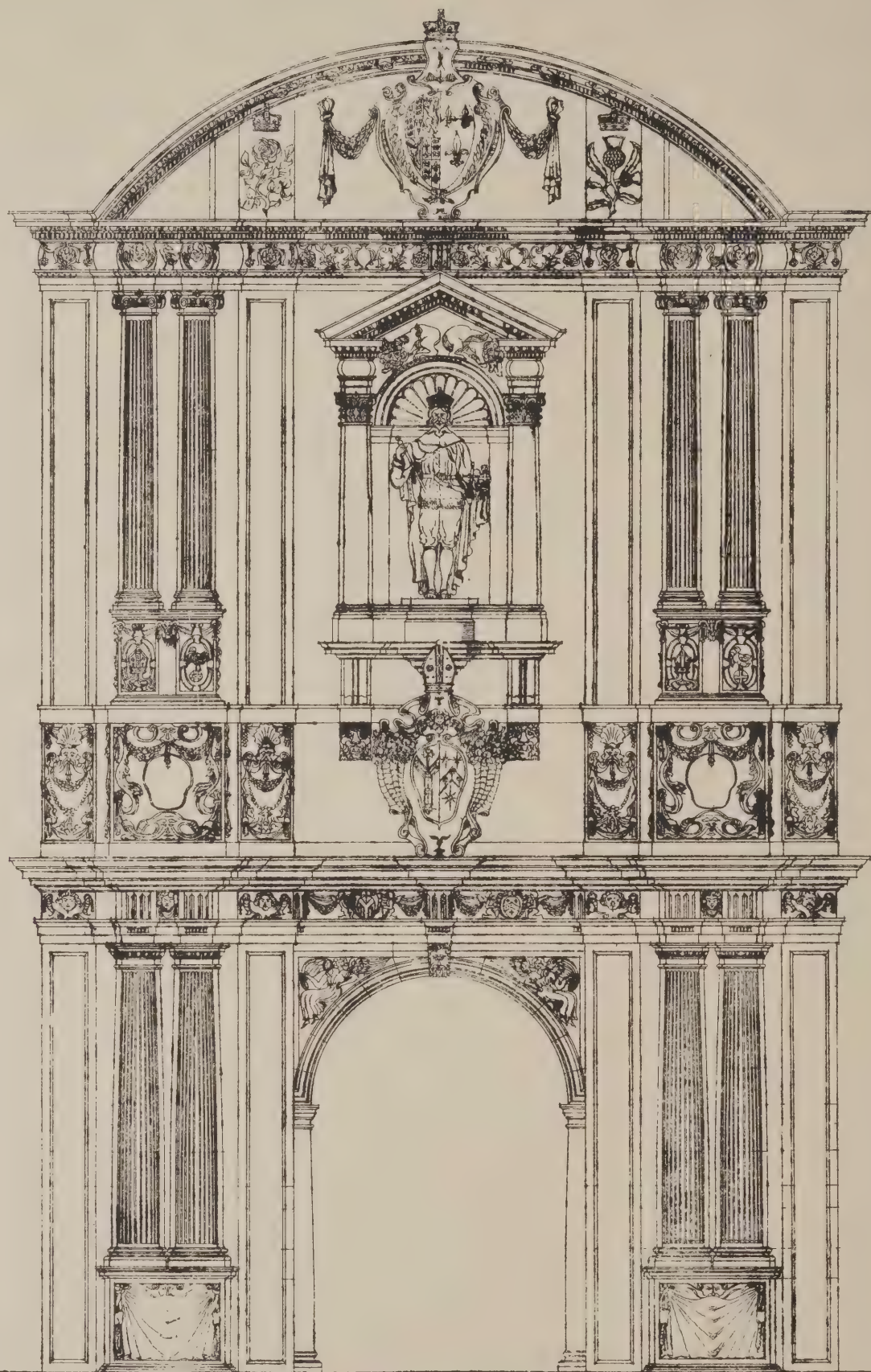
VACATION SURVEYING CLASS.—(Special Certificates.) H. R. Andoe (Guildford), J. H. P. Bradford (Martock), V. H. Chabot (Selhurst), A. C. Clifford (London), J. W. Huelin (Jersey), K. T. Lomas (London), H. H. Nersworthy (London) and H. E. Parker (Harrow Weald).

* Obtained the number of marks qualifying for a prize.

The Question of Sites.



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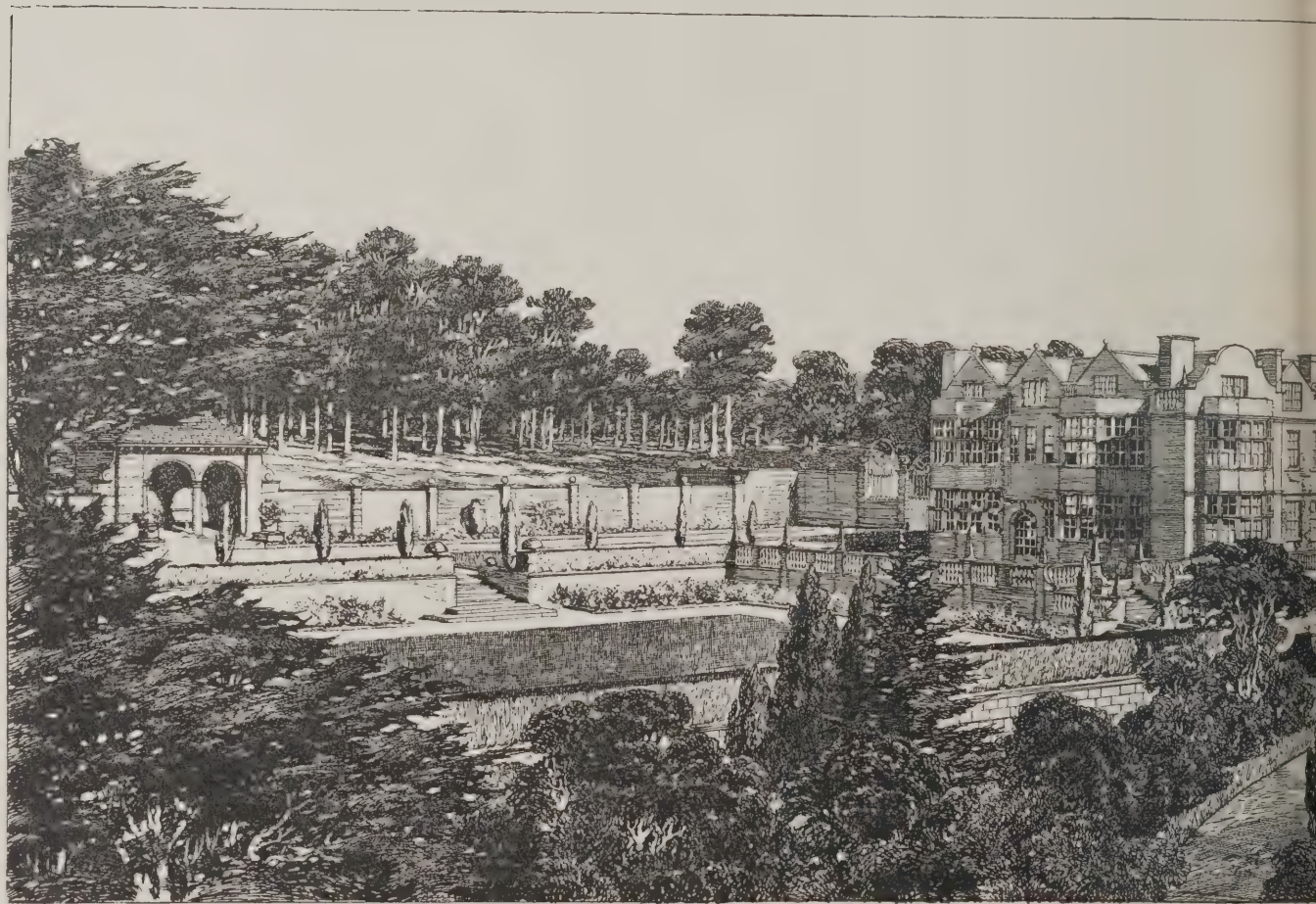


SCALE OF FEET

R. J. EVERETT & SONS 55 LUDGATE HILL, E.C.

ST. JOHN'S COLLEGE, OXFORD: GATEWAY IN INNER QUAD.
MEASURED AND DRAWN BY JOHN MCINTYRE.

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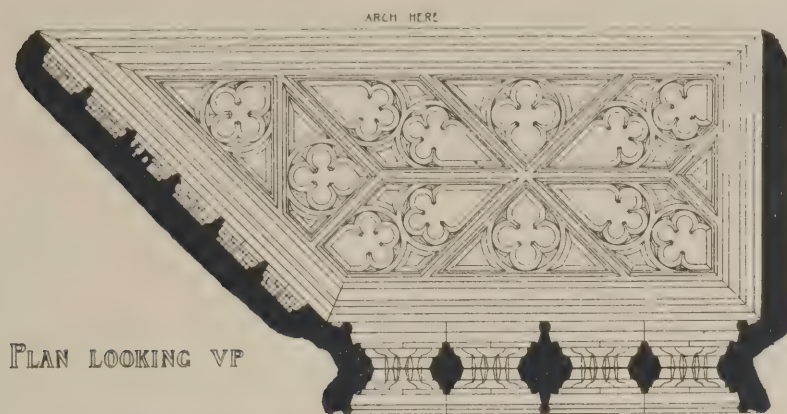
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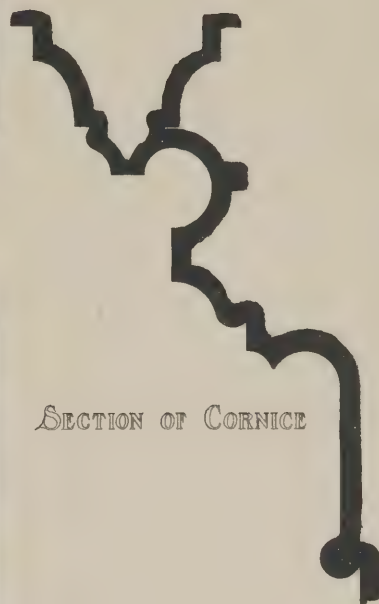
Charles Freshfield Esquire

*Residence by Edmund Fisher
Garden by Thomas H. Mawson*

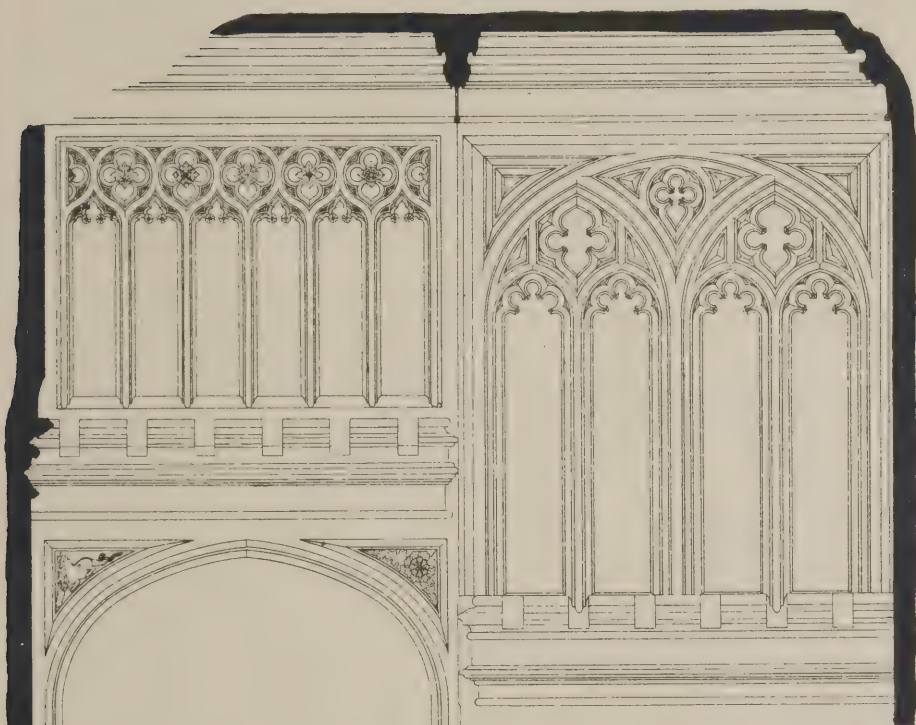
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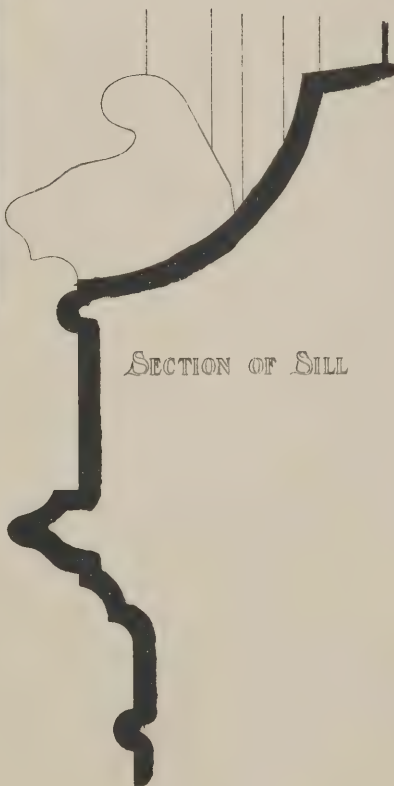
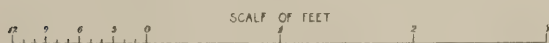
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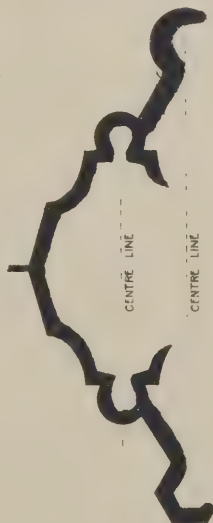
ELEVATION SHOWING
PANELLING AND WINDOW



SECTION OF SILL

DETAIL OF PORTION OF
ENTRANCE TO
SOUTH AISLE OF
HENRY VII'S CHAPEL,
WESTMINSTER ABBEY.

FROM MEASUREMENT.



SECTION OF MULLIONS

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Bricks and Mortar.

APHORISM FOR THE WEEK.

I'll be an Artist, and I'll do things.—

KIPLING ("The Light that Failed").

Our Plates.

THE drawing by Mr. John McIntyre illustrates the central gateway of the colonnade on the east side of the inner Canterbury Quadrangle of St. John's College, Oxford. The work is attributed to Inigo Jones, and was built about 1635. The bronze figure is that of Charles the First. The gateway on the opposite side of the quadrangle is of similar detail and bears the figure of Queen Henrietta. The figures, which are by Hubert le Sueur, are beautifully modelled. — The illustration of "Pressridge" shows the terrace scheme and garden front. The house is a large and commodious one, designed and now being carried out by Mr. E. Fisher, of London, the terraces and gardens having been designed by Mr. Thomas H. Mawson, of Windermere. The district is a fertile one and the site excellent. Outside the circumscribed area of the terraces and pleasure grounds, it is intended to encourage the bracken and heather that abounds naturally and to plant Scotch fir abundantly, interspersed with silver birch. The contractor for the house and terraces is Mr. Job Luxford, of Forest Row, Sussex. The whole of the walling is to be in the local Sussex sandstone, built in random courses.

The Adelphi.

IT is interesting to note in reference to the suggested site on the Embankment for the new County Hall that when, in 1768, Robert and James Adam proposed to build the Adelphi Terrace they were accused of having encroached upon the river, and the case went before Parliament. But Parliament was in favour of the new improvements, and the famous architects were allowed to proceed. The name "Adelphi" itself commemorates the two brothers; while the John, William, Robert and James Streets, in the vicinity, include other members of their family. David Garrick once wrote to the "dear Adelphi" asking them to concede the corner house of Adam Street to a bookseller friend of his.

Dublin New Municipal Buildings.

THE Improvements Committee of the Dublin Corporation has prepared a scheme for the erection of new Municipal

Buildings and for the re-arrangement of the City Hall, in consequence of the accommodation of the existing civic buildings becoming insufficient for the requirements of the staff, which has been increased by the taking over of the "added areas." The Committee are of opinion that the object in view can be best achieved (in addition to utilising the City Hall) by erecting a new building to form an extension of the present Municipal Buildings. Sketch plans have been furnished by the City architect, according to which the new building will form an extension of the present Municipal Buildings, with frontages to Castle Street and Lord Edward Street of about 136ft. and 120ft. respectively, and a return frontage between Lord Edward Street and Castle Street of about 104ft. The buildings will be three storeys high above the basement, and about forty rooms will be available for use. As regards the cost of the new building, the City architect is of opinion that the Corporation should be prepared for an expenditure of £30,000.

Westminster Cathedral.

By permission of Cardinal Vaughan the members of the Catholic Association paid a visit on Saturday afternoon to the new Roman Catholic Cathedral, Ashley Gardens, Victoria Street, Westminster, built from the designs of the late Mr. J. F. Bentley. The Rev. J. P. Bannin, chairman of the Executive Committee of the Catholic Association, speaking from an improvised rostrum, delivered a brief address on the architectural features of the cathedral. The Byzantine style, he said, was chosen so that it should not in any way compare with the existing cathedrals in London or other cities of England. The three cupolas over the nave



ST. JOHN'S COLLEGE, OXFORD: DETAILS OF GATEWAY, INNER QUADRANGLE.
MEASURED AND DRAWN BY JOHN MCINTYRE.

served a special purpose—they allowed a passage of air between them, which kept the building cool, and they gave a certain amount of expansion, which constituted for the roof of the cathedral its main strength. The Campanile was now perhaps the only existing specimen of a Byzantine campanile since the regrettable collapse of the Campanile of St. Mark's, at Venice. Some persons have criticised it, but when they remembered that it was a great steeple reaching up to the sky, in which the bells would call people to, at least, an acquaintance with the Catholic faith, they would admit that the tower could not be too high. The cathedral authorities had just been presented with three bells that were to be consecrated and named after the archangels in heaven. To most of them the building would appear now a stupendous structure of brick, but it needed but a little imagination to picture what a revelation of beauty it would be when, as was intended, the walls were covered half way up by marble, and the other half by golden mosaics.

The Garden City Project.

A SPECIAL GENERAL MEETING of the Garden City Association was held last week, when a discussion took place on the garden city project suggested by Mr. Ebenezer Howard. Mr. Howard explained the details of his scheme for the purchase of a large agricultural estate of about 6,000 acres with the object of establishing a garden city, having a population of about 30,000 persons, as an experiment. He said that one of the fundamental principles which the garden city movement was pledged to carry out was that they should endeavour to bring about

a concerted movement of population from greater cities to sparsely-populated areas, and while thus increasing land values should make arrangements that these should become the property of the community which created them. If that principle were to be carried out a broad belt of land around the area which was to be built upon must be secured. The objection had been raised that a town of 30,000 inhabitants would not give its inhabitants all the advantages of the best town life, and that the city should be double the size suggested. He asked, however, whether it was clear that two towns of 30,000 inhabitants each, surrounded by open country and connected with each other, would not be able to offer all, and possibly more than all, the advantages of one town of 60,000 inhabitants. Replying to questions, he said it was possible to get an estate which would enable them to work upon the lines suggested, but the price of land near some existing town would be altogether prohibitory.

In Memory of Onslow Ford.

THE Works Committee of the Marylebone Borough Council has considered an application made to it on behalf of a committee of admirers of the late Mr. Onslow Ford, R.A., which is raising public subscriptions so as to erect a memorial to his memory at the junction of Grove End Road and Abbey Road, St. John's Wood, near where he lived and died. The committee asked the Borough Council, when the memorial is erected, to take over the future care and maintenance of it. The Works Committee agrees to the site proposed and to the suggestion that the Borough Council when the memorial is erected should take over its care and maintenance.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Vibration from Machinery.

WISBECH.—C. H. P. writes: "In Professor Adams's reply to my enquiry on page 350 of your issue for July 16th I am asked to supply fuller particulars. It is printing machinery that causes the vibration. Diameter of shafting from 2in. to 2.25in.; revolutions per minute, 160; no toothed gearing used; the shafting carried on iron brackets, secured to 9in. by 3in. bearers parallel to principals."

The particulars now given show that the machinery is very light, and the vibration is probably due to the bearers being too small. A scantling of 9in. by 3in. to carry shafting is very little for a 20ft. span; one 11in. by 4in. or two 9in. by 3in. beams would have been more like the proper allowance. The brackets should have a sheet of hair-felt interposed between the base and the bearers, and the bearers themselves should rest upon two thicknesses of tarred felt and be wedged into the wall pockets.

HENRY ADAMS.

Washed Sand for Filter Beds.

HANWELL.—AQUA writes: "Kindly describe how a pit for washing sand and ballast should be constructed—size of filter bed, 30ft. by 30ft. by 4ft. deep."

Sand and ballast for filter beds are washed with a hose in a sort of bay at ground level with a dwarf cement-rendered wall on three sides; cement floor and channel on the front. It does not require a large place, say one-twentieth area of bed, as a portion only is treated at one time. Possibly "Aqua" might get an insight into the work at the Richmond Waterworks.

HENRY ADAMS.

Openings for Architects' Assistants in New Zealand.

D. H. W. writes: "Are there any openings for architects' assistants in New Zealand?"

We are informed by the Managing Committee of the Emigrants' Information Office that there is no special demand for architects' assistants in New Zealand, the supply trained locally being for the most part sufficient.

Parisian Architects' Offices.

EDINBURGH.—HOPE writes: "Kindly give some information as to the chance of getting a situation as draughtsman in a Parisian architect's office."

I do not think an English draughtsman would stand much chance of obtaining a salaried berth in a Parisian office, as in France they are far ahead of us in the education and training of architects. A pre-eminently good draughtsman well up in freehand and figure drawing might obtain employment, but I should not advise going over on chance, unless with personal influence.

R. W. C.

Buildings around Barrow.

BELFAST.—A. B. C. writes: "I intend going to Barrow for a sketching holiday, and should be glad to know the names of some buildings in that part worth visiting."

The chief building in the neighbourhood of Barrow is, fortunately, the one which is nearest, namely, Furness Abbey, an erection belonging to the Cistercian monks and containing examples of all styles: Norman and Transitional in the remains of the church proper, Early English in the buildings on the east side of the cloister, Decorated in the chapel of the infirmary, and Perpendicular in the tower of the church. Cartmel Priory is also near at hand with Transitional Norman in choir and transepts, Decorated in the south chapel, and Perpendicular in the nave. Other buildings in the vicinity are Ulverston Church, Late Perpendicular with Transitional doorway; Kirkby Church, very ancient font; Kirkby Ireleth, Late Perpendicular and Norman doorway; Urswick, Norman with several good monuments; castles at Dalton,

Gleaston and Fouldrey, the last in Peel Island. A few days should, if possible, be devoted to Lancaster and neighbourhood. In Lancaster itself are the Decorated castle and the Early English church (part only is Early English, the rest belonging to the eighteenth century) with good monuments. Churches near Lancaster:—Heysham, Norman and traces of Saxon; Middleton, Norman and Perpendicular with monuments; Overton, Norman door; Tunstall, Late Perpendicular, &c.

R. W. C.

Buildings in the Neighbourhood of Torquay.

LONDON, E.C.—H. D. K. writes: "I propose to spend a holiday at Torquay, and desire to measure part of a building for the Intermediate Examination of the R.I.B.A. Would Old Cockington Church be suitable? Kindly mention any other churches, &c., in this vicinity."

I am unacquainted with Old Cockington Church, and whether it is suitable for measurement must be left to your own discretion. Devonshire abounds with excellent mediæval churches, generally of Perpendicular date and with elaborately-carved pulpits and wood screens, and almost every village church has features worthy of study. At Torquay you will find yourself in a district which contains more work for a student than probably any other town in the county. Monastic remains will be found in Tor and Buckland Abbeys and castles at Berry Pomeroy (Henry III., and also remains of a Tudor manor-house) and Totnes (Henry III.). At Darlington there is a remarkable unfortified manor-house with extensive farm buildings (Richard II.), and many unusual features. Near Newton Abbots and Newton Bushell (both these towns are now known under the single name of Newton Abbots) there are two good Perpendicular churches at Wolborough and Highweek, as well as the Elizabethan mansion at Ford House. Teignmouth contains few antiquities, as it was burnt by the French in 1690.

R. W. C.

An Ancient Lights Question.

BANGOR.—W. G. W. writes: "Certain alterations and additions are being made as shown on the accompanying tracings (not reproduced). The owner of the cottage complains that his light will be interfered with when the building is completed. The cottage window in question has been recently enlarged without obtaining the consent of my client. Do you consider that when the building is completed the light will be reduced? Can my client erect a hoarding so as to darken the increased area, allowing only the old opening uninterrupted?"

I do not consider that the light, as such, will be in any way interfered with by the proposed new building even if it is carried up beyond the firm line to the dotted line (it is not quite clear which is intended), as the angle with the horizon made by a line joining the apex of roof to the upper side of bottom rail of sash, that is to say, the lowest point in the opening, is only 30 degs, the chimney being an allowable feature. It may make a slight difference to the cottage if the aspect of the window is such that the new building deprives it of morning or evening sun, when the rays approach the horizontal, but there can be no prescription for an easement of light and air over open land. Your client can obstruct the window: "if a person . . . alter or enlarge his lights, or add new ones, the owner of the adjacent property may entirely obstruct them until they are reduced to the original form and number, but no longer."

R. W. C.

Isle of Wight Churches.

LONDON, W.—F. J. M. writes: "Please name some churches in the Isle of Wight or the neighbourhood suitable to measure for the R.I.B.A. Intermediate Examination."

You will find plenty of food for testimonies of study in the Isle of Wight without going to the mainland, though there you would be in touch with such well-known monuments as Netley and Romsey Abbeys and the crowd of ancient buildings in and around Winchester. In the Isle of Wight there are buildings of all periods and all classes, from the Roman villa at Morton Farm, one mile from Brading on the Sandown Road, and well worth a visit from any architectural student, to Carisbrooke Castle, with examples of varying periods. Norman: Taverland, Bonchurch (old church—the new one is by

Ferrey), Wootton, Shalfleet. Early English: Binstead (a good font), remains of Quarr Abbey, Niton (ancient cross in the churchyard as well), Whitwell (Norman as well as Early English, and most interesting). Decorated: Blackwater (monuments in the church), Godshill (Perpendicular as well). Perpendicular: Carisbrooke Church. In addition, Freshwater Church is Transitional, Norman and very interesting, Arreton Church is of most of the styles, and features of interest will be found at Bryson or Brixton Church, Kingston, Shorrell or Shorwell, &c. Domestic buildings of interest will be found in Chale Farm at Chale, Kingston manor-house, Shorwell manor-house (and Westcourt and Wolverton houses in the district), Mattestone manor-house and Stenbury manor-house.

R. W. C.

Books on Building Construction.

RYE.—THEORY writes: "Kindly suggest the best books for me to study for subjects 4 and 5 in the R.I.B.A. Intermediate Examination. For subject 4 (History of Mediæval and Renaissance Architecture) I have Banister Fletcher's 'History' and Rickman's 'Gothic.' For subject 5 (Theoretical Construction) I have partially studied Mitchell's 'Advanced Construction,' Middleton's 'Stresses and Strains' and 'Specification No. 5,' but these seem to be somewhat conflicting. Is there no book published giving the calculations and formulæ in a more concise and comprehensive manner? I cannot find in any of my books how to calculate the size of a wrought-iron or a steel girder to carry a given weight and of a given span."

For subject 4 the books you mention are among the best, and you can certainly use them as your *text-books*, a word which does not imply that you will find therein plans, sections and elevations with complete description of every example of the various styles ever erected. You must bear in mind that a text-book can only summarise the peculiarities and distinctive features together with a reference to the best known examples. Having mastered these you should read any kindred volumes which may be available, compare them and draw your own conclusions. You would find a cursory reading of Ferguson's "History of Architecture" useful as well as interesting, and such publications as the "A.A. Sketch-Book" and the current building periodicals are replete with information of this class. Anderson's book on the Renaissance in Italy is the best work on the subject. For subject 5 it is evident that the trouble is to be found in your own words—"I have partially studied," &c. This is an exemplification of the old adage that things done by halves are best not done at all, for it is quite clear that even what you have read you have not read intelligently or you could not have made such a blunder as to state that neither Mitchell nor Middleton elucidate the simple problem of a loaded girder. The former explains the subject fully under "Girders" in *Advanced Building Construction* and gives, on p. 286 (of 1894 edition), "Beams supported at both ends" and with various weights; and Middleton devotes 22 pages to "Stresses in flanges" of which sixteen deal with your problem. Nothing can

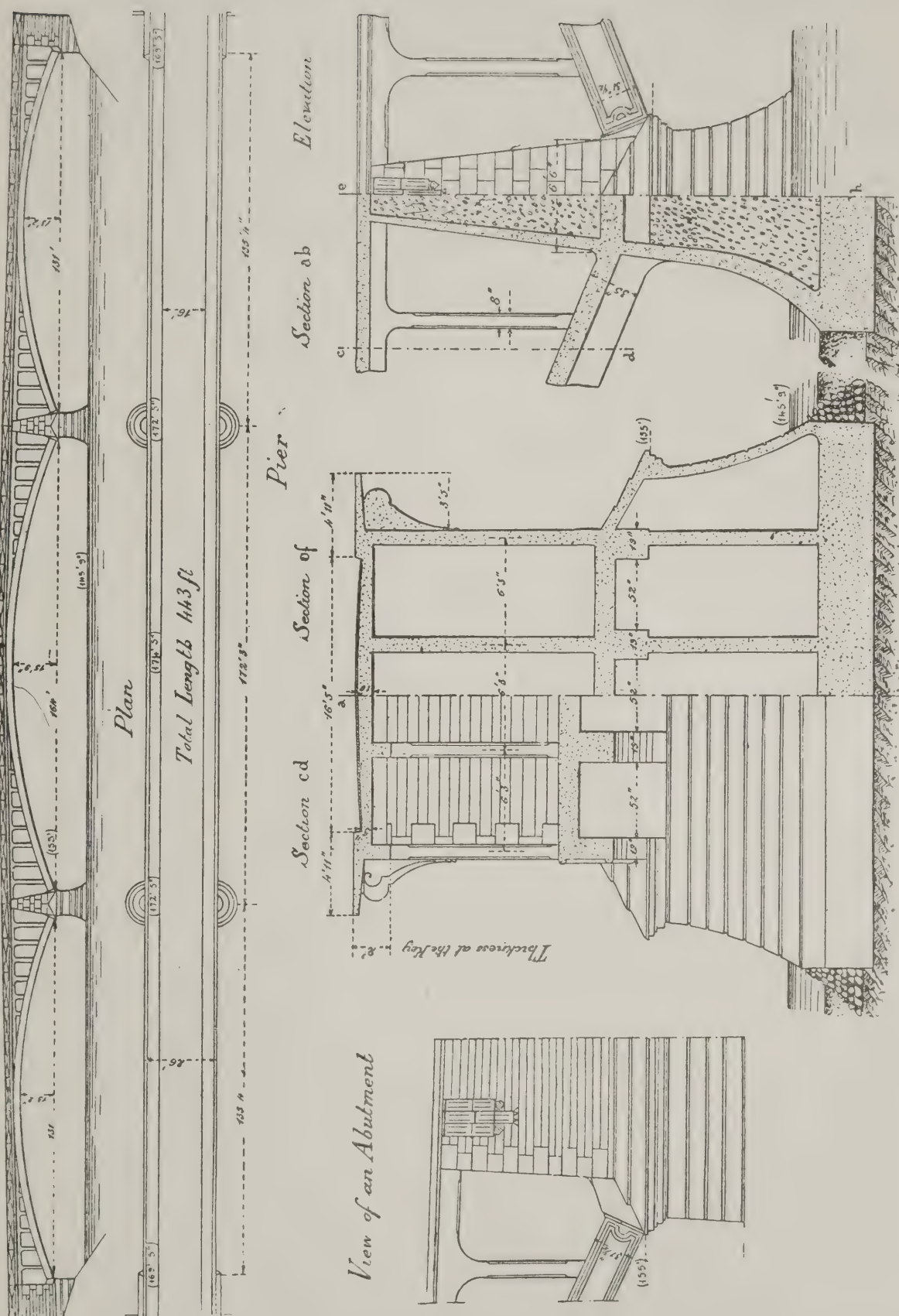
possibly be simpler than the formula $s = \frac{WL}{8d}$ for a distributed load on a girder, or $s = \frac{WL}{4d}$

for a concentrated load. As a beginner you had better confine your preliminary studies to one book, or you will become still more puzzled with the different formulæ and constants, and will in the end try and work out your girders using one equation and endeavouring to solve it with the aid of a constant belonging to quite another formula. For instance, for a rectangular fir beam centrally loaded either of the two following formulæ are used:—

$$(a) BW = \frac{4KBD^2}{L} \text{ or } (b) BW = \frac{kbd^2}{L}$$

In each case B and D represent the breadth and depth of the beam in inches; L represents the length, but in (a) the length is taken in inches while in (b) length is in feet; k = the constant which in (a) is 10 cwt. and in (b) 3½ cwt. You could not correctly solve (a) with the constant of (b) nor vice-versa. Of the two, the former is the simpler formula as B and K are in cwt. and B D and L are in inches.

R. W. C.



BRIDGE OVER THE RIVER VIENNE. CHATELLERAULT, FRANCE, CONSTRUCTED ON THE HENNEBIQUE SYSTEM OF FERRO-CONCRETE

FERRO-CONCRETE.

DURING recent years a new method of construction has been developing somewhat rapidly on the Continent, and has now made its way to this country. We refer to the use of steel combined with concrete, which goes by the generic names of ferro-concrete, armoured concrete, reinforced concrete, &c. It is not many years since the idea of forming and moulding concrete slabs, pipes, &c., with the addition of a metal skeleton was first conceived, and experiments undertaken, the material being used, however, in a timid and tentative manner, but the results of the experiments were so successful, and the lasting quality of the material so apparent, that Continental engineers and architects quickly extended this form of construction to floors, arches, bridges, reservoirs, &c. Ferro-concrete is especially useful in foundations, and tends to economy; it is also used for the construction

The loss of available section due to riveting in the case of built-up steel sections is avoided.

The designing of armoured concrete girders and columns is somewhat difficult, but the proportioning of the concrete and iron bars depends on the fact that the latter must have the proper sectional area to resist all the tensile stresses in the beam or slab, and the disposition of the iron bars is found from the fact that the value is in direct proportion to their distance from the neutral axis. The formula for calculating the influence of the moment M on a given section of ferro-concrete at a distance y from the neutral axis $= a \frac{My}{I}$, where a represents the

ratio of the co-efficients of elasticity in iron and concrete. The co-efficient of elasticity of iron is 12,500 tons per sq. in., and that of concrete has been determined at 1,250 tons per sq. in., so that a , the ratio between the co-efficients, = 10. All the tensile stresses are calculated to be taken up by the iron bars, but at the same time

only caused vibrations of $\frac{1}{16}$ in., lasting $\frac{1}{4}$ ths of a second. Considering the dead weight of the floors, the value of the weight, and the height from which it fell, also the extent and duration of the vibration, this experiment needs no further comment.

Tests have also been made which show that the strength of ferro-concrete construction is practically unimpaired by fire, even when water is turned on from a fire hose on the heated walls and floors.

It is surprising, in view of the advantages offered by this system, that it has been so slow in making its way in this country. Probably this is because there have not been any firms in this country until recent years who undertook ferro-concrete construction, and from a want of knowledge among engineers and architects of the principles upon which ferro-concrete is designed. There are now, however, one or two branches of large Continental ferro-concrete building firms established over here. Chief of the systems of ferro-

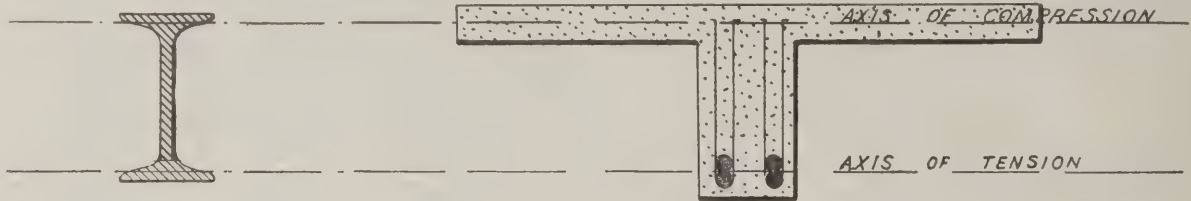


FIG. 1. SECTION THROUGH A-B, FIG. 2.

of pipes and piles. When compared strength for strength with other building materials, ferro-concrete shows a saving of from 15 to 20 per cent. Many systems of iron-concrete construction have been brought out on the Continent. The system, light in construction, gives graceful lines in design, is practically imperishable, and resists fire remarkably well. The French Government recently created a separate department at the Ministry of Public Works, under the management of M. A. Considère, Chief Engineer for Ponts and Chaussées (who is the author of standard works on the principles of this kind of construction), to give attention to all matters relating to ferro-concrete construction, with a view to its greater development. It will be seen from this that the method has now got beyond the experimental stage and assumed real importance.

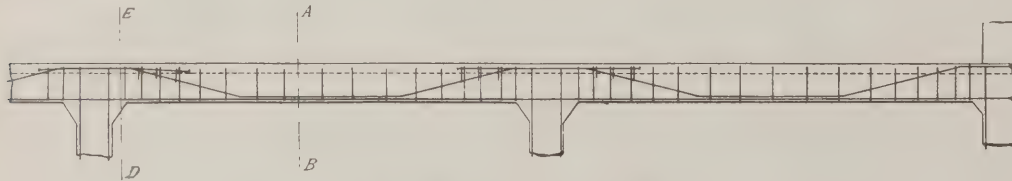


FIG. 2. SECTION THROUGH BEAM.

The principles which all the systems of ferro-concrete have employed are that the iron should be so disposed in the concrete that it takes all the tensile stresses, and the concrete takes all compressive stresses. The concrete, of course, binds the steel bars together, and protects them from damage by fire and oxidization. The great advantages of the system are that girders and columns are so quickly and so cheaply constructed. This is due to the fact that the steel sections used can always be bought in the market, and are not subject to such fluctuation and shortage of supply as built-up sections, which, furthermore, are very laborious to construct. In fact, a girder or column can be constructed in ferro-concrete with fewer men in about half the time it would take to get a built-up girder or column constructed, and it has been found that a building can be erected in ferro-concrete in about one-third the time it would take if specially built-up steel stanchions and girders were used. In addition to the saving of cost in this matter of labour, considerable saving is effected in the expense of annual painting, a necessity with exposed iron-work. And as we said above, ferro-concrete is very lasting, and is fireproof.

With the exception of the carpenters who erect the casing and shuttering required for the work, and of the smith to attend to the very simple smithy work required, only unskilled workmen, such as ordinary labourers, need be employed, with a foreman of ordinary ability.

the stresses should not exceed the limits of elasticity of the concrete, or cracks will result. The breaking strain of concrete in compression mixed in the proportions used in ferro-concrete is between 3,000lb. and 4,000lb. per sq. in., and the safe load is usually taken at about 400lb. per sq. in., or may be safely increased to 550lb. per sq. in. The safe tensile load on the iron bars is 6.5 to 7 tons per sq. in. It might be thought that the adhesion between the iron and the concrete would be destroyed by changes in temperature, but this has been proved not to be so, for the co-efficients of expansion and contraction have been demonstrated by M. Durand-Claye, Chief Engineer of the French Ponts and Chaussées, to be identical to the fifth decimal. The adherence between steel and concrete is estimated by Professors Baushinger and Ritter at 570lbs. per sq. in.

With regard to the all-important point of the preservation of steel when encased in concrete, experiments have gone to show that oxidization does not occur even after many years subjection to sea-water.

A very material advantage of ferro-concrete is that buildings constructed of it have an almost entire absence of vibration, a fact of the greatest importance in factories, workshops, &c., which carry machinery. This is especially valuable in bridges. Very severe tests have been made on this point, and we may give particulars of one carried out recently in Paris by the engineers of the Paris and Orleans Railway Co., at their electric work at Austerlitz Station. Two floors had been constructed, one in ferro-concrete, the other with girders and brick arches, each with the same bearing and calculated for a similar free load. These floors were tested in order to ascertain the result of shocks. The dead weight of the floors were: Iron and brick floor, 100lbs. per sq. ft.; ferro-concrete floor, 62lbs. per sq. ft. A weight of 112lbs. dropped from a height of 6ft. 6in. on the iron and brick floor produced vibrations of $\frac{1}{16}$ in. amplitude, lasting two seconds, while a weight of 220lbs. falling 13ft. on to the ferro-concrete floor

concrete construction is the Hennebique, which gained the Grand Prix at the Paris Exhibition in 1900 for its inventor, M. Hennebique, of Paris. M. Hennebique's patents are being worked in this country by Mr. L. G. Mouchel, M.Inst.C.E. of France, who has recently published a large pamphlet explaining the Hennebique system, and giving particulars of tests, &c. The volume is well illustrated, and the large number of examples show how extensively the system has been applied.

The special features of the Hennebique system are as follows:—In a beam of ferro-concrete the axis of compression is at the top and the axis of tension below (see Fig. 1), exactly as happens in a rolled steel joist, as shown on the left of the illustration. Now, in the ferro-concrete the compression is resisted by concrete and the tension by the iron bars. But concrete would not alone suffice to form the web (still comparing the ferro-concrete beam to a rolled joist), as it might be subject to tension and slipping. M. Hennebique has therefore devised the system of distributing stirrups along the whole length of the beam, which, embedded in the core of concrete, and connected intimately with the upper and lower portions of the beam, makes a solid and compact girder capable of bearing the heaviest loads. These stirrups are formed of hoop-iron of a proper gauge and width; and can be seen in section in Fig. 1, which is an example of a beam designed to resist the maximum bending moment, which occurs at A B in Fig. 2, the cross-section at this point being as in Fig. 1. The cross-section for resisting the maximum shearing thrust which occurs at E D in Fig. 2 is shown in Fig. 3. The tension bars are of two kinds, namely, straight bars parallel to the lower face of the beam, and bent or cranked bars placed over them, but in the same vertical plane. The bent bars, taken in connection with the straight bars and the stirrups (the latter being placed closer together at the ends of the beam), constitute an indeformable triangle, and the resistance afforded to shearing strain thus increases near the supports, *i.e.*, where this strain reaches its maximum. A beam so formed is very similar to a timber beam trussed with iron tie-rods and brackets. Fig. 2

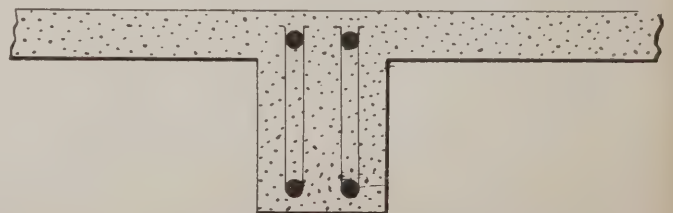


FIG. 3. SECTION THROUGH E-D, FIG. 2, RESISTING THE MAXIMUM SHEARING STRESS.

shows this arrangement, and is a longitudinal section of a continuous Hennebique beam. Fig. 4 shows the respective positions of bars and stirrups, and how any bending strains of the lower bars become transmitted to the upper part of the beam and transformed and distributed in the way of compressive strains in the mass of the concrete. Fig. 5 shows a cross-section through this beam, showing in a longitudinal section above it the floor constructed in a precisely similar manner to the beam. For heavy loads a main beam supports a secondary one, which receives the flat beam constituting the floor. This complex arrangement of main and subsidiary beams and floor is shown more clearly in Fig. 6. The beams and floor, it will be seen, form a monolithic mass, the whole series being joined together so as to form a continuous beam without scarf or joint. For ordinary purposes the flat beam described constitutes an excellent floor in itself without the aid of main or secondary beams, but for floors of warehouses sustaining heavy loads, or for large buildings, when it is necessary to minimise the number of supports or columns, beams become necessary. This form of floor presents a good ceiling for the purpose of decoration, either to be moulded and panelled in plaster or left plain, and simply whitened or coloured. The pillars or columns are constructed on the same principle their form being shown in Figs. 4 and 6; they can be moulded to almost any shape. They offer enormous resistance to oblique strains.

To demonstrate the value of the stirrups used in the Hennebique system, two sample beams were made exactly with the same quantity of materials, but the one with and the other without stirrups, and were subjected to similar loads until one or the other showed signs of cracks. Needless to say, the beam without stirrups gave this sign first. On the load being increased the concrete broke away in lumps from the beam without stirrups from around the tension bars, leaving them exposed, whereas under the same load the beam with stirrups showed only small vertical fissures which did not practically endanger its safety.

The illustration on the next page shows, when in course of construction, the first floor of a large cold-storage warehouse recently erected on the Hennebique system for the Southampton Cold Storage and Lairage Co., Ltd. This, taken from a photograph, show very clearly the way the system is carried out. We give elevations, sections and plan of the bridge of Chatellerault, over the River Vienne (see p. 387), which is built of ferro-concrete; foundations, piers, abutments, arches and floor were all made of ferro-concrete. The total length of the bridge is 443ft., and is composed of three spans—two lateral ones of 135ft. with a rise of 13ft., and a central span of 164ft. with a rise of 15ft. 8in. Four arches in ferro-concrete, 20in. high, bear, by means of braces 8in. by 8in., the floor of 25ft. width. The sidewalks are partly carried on cantilevers.

To give an idea of the lightness of this structure, we may say that in the central arch the total thickness at the centre is only 28in. The foundations of this bridge were very simple, the calcareous rock being found at 5ft. below water-mark. The piers and abutments are constituted of four braces corresponding to the arches, and connected by a curtain in concrete of 5in. thickness, which give them their external shape. They are filled in with weak concrete of hydraulic lime. The calculations were based on the supposition that the bridge would have to bear a load equal to the passage of two files of two-axle carts weighing sixteen tons each, the sidewalks bearing at the same time a dead weight of 100lbs. per sq. ft. The centering being placed, and the foundations ready, the concreting was begun on August 15th, 1899. It was completed by November 5th, and the centering was removed on the following December 5th.

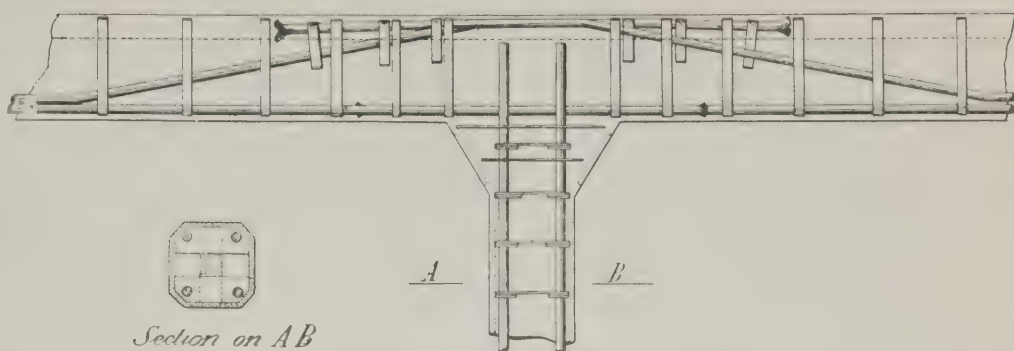


FIG. 4. JUNCTION OF TWO BEAMS AND PILLAR.

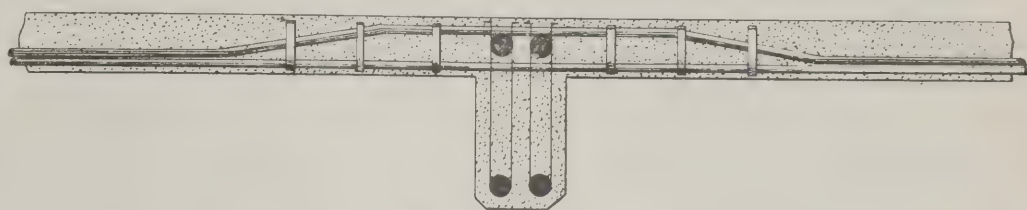


FIG. 5. CROSS-SECTION THROUGH BEAM.

The bridge was then subjected to a series of trials under the direction of Engineer Aubin, of the Ponts and Chaussées. The tests by dead weight were conducted in the following manner:—Each bay was loaded over its total length, then on each half, and then on the middle. This load was formed of moist sand at the rate of 165lbs. per sq. ft. on the road bed and 123lbs. on the sidewalk. The official report of the trials states that: "The maxima of depressions were $\frac{1}{4}$ in. for the arch of the left shore, $\frac{1}{8}$ in. for the arch of the right shore, and $\frac{1}{8}$ in. for the central arch. The mean depression of the lateral arches $\frac{1}{3000}$ of the span, and for the central arch only $\frac{1}{5000}$. When the superloads were removed and the bridge completely cleared the arches returned exactly to their original position." Then the bridge was tested with a moving load composed of: one steam-roller of sixteen tons, two two-axle carts of sixteen tons, six single-axle carts of eight tons, which, together with the teams, gave a total weight of about forty tons passing

remained inferior to those caused by the dead weight tests. There never was any permanent deformation. But the most remarkable fact that was ascertained in the course of these trials was the solidarity between the three arches, so that the load which caused a deflection in one of them caused at the same time a raising up of the contiguous arch. The dead weight of this bridge, all told, is only 250lbs. per sq. ft., and has cost less than £8,000 to construct.

Concrete piles constructed on the Hennebique system possess the following advantages:—They can be moulded to any length and section, and can be driven as a continuous pile or sheet pile, without scarfing, practically to any depth, and do not decay. The sheet piles form a wall without a single horizontal joint, which can be calculated to resist any pressure that can be brought to bear upon it. On each side of the sheet piles is a semicircular groove which forms a cylinder with the groove in the next pile, which is filled with concrete, thus joining the piles together and making a water-tight wall. Their resistance to the impact of a falling monkey is only about half that of timber piles.

We give the illustration of the cotton spinning mill at Lille (see next page) as an example of logical design in this new method of construction. If the attempt is made to imitate other forms of construction, or to adapt this system to the narrow bounds of the styles, it will be doomed to failure from the first. If the construction is frankly acknowledged, as in this example, the results will be satisfactory.

Our illustrations for this article are all taken from the pamphlet on the Hennebique system to which we have referred. The London address of Mr. L. G. Mouchel is 38, Victoria Street, Westminster, S.W., but he has branches at Grosvenor Chambers, 16, Deansgate, Manchester, and Maritime Chambers, Southampton.

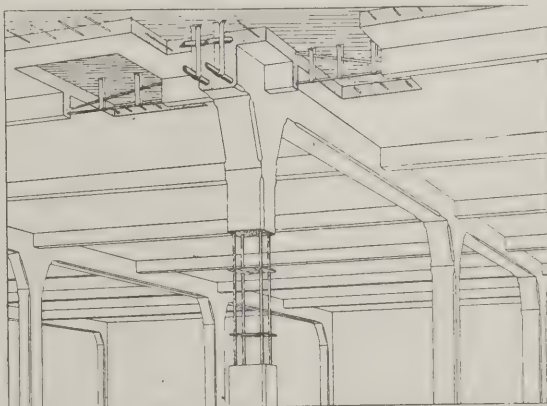


FIG. 6. SKETCH SHOWING ARRANGEMENT OF BEAMS, COLUMNS AND FLOOR.

simultaneously on the bridge, the sidewalks of which bore, in addition, a load of 80lbs. per sq. ft.

As a further test, 250 infantrymen were made to cross the bridge in a body, first at cadenced step, then in double-quick time. After this the steam-roller was passed over the platform, upon which cleats of wood 2in. thick were strewn, in order to produce a series of shocks. All these the bridge successfully withstood, the maxima of depressions attained not exceeding $\frac{1}{3000}$ of the length of the arches, and the deformations of the arch with regard to its median line always

A New Parochial Hall and Institute for St. Martin's, Potternewton, has been erected at a cost of between £3,000 and £4,000, from the plans of Mr. Percy Robinson, selected in a limited competition. Of Morley stone, and designed in a free treatment of Gothic, the building will front into North Road, immediately opposite the church. The accommodation on the ground floor will comprise five classrooms and a lecture room or gymnasium 36ft. by 26ft. On the first floor there will be a much larger hall, 80ft. by 36ft., which may be used for meetings, entertainments and other purposes. The hall will be fitted up with a stage and dressing-rooms. A house for the caretaker also forms part of the main building.

CRANTOCK CHURCH.

Restored by Mr. Edmund Sedding.

THE church of St. Crantock, near Newquay, has now been reopened after a thorough restoration by Mr. Edmund Sedding, architect, of Plymouth. Unlike Cornish churches generally, the nave has no aisles; its length is 52ft., the width being one-third of its length. At the east end it branches out into shallow transepts, and at this point the original Norman plan stops. The central tower fell into a ruinous condition in the fourteenth century (the date of the existing chancel arches), and that something was done at this time an examination of the walls clearly shows, but eventually the tower fell to the ground.

The transept arches, as they stand at present, are rough examples of seventeenth-century work. The chancel (or, rather, the choir, for it was a collegiate church) measures 44ft. in length by 16ft. in width, the total width, including the aisles, being 40ft. The aisles of the original Norman choir were narrower than the present aisles. The remains of that Norman church are scanty, consisting of the north transept buttresses, part of a doorway leading from this transept to the collegiate buildings, the jambs of the arches between the transepts and the chancel aisles, and part of the central tower arch and piers. The lower part of the western tower was built in the thirteenth century, the upper stages being two centuries later. These walls were in a most dangerous condition, but they have been very carefully dealt with by rebuilding a great portion from the inside, in order that the outside weather-stained appearance may remain undisturbed. The choir, with its aisles, was rebuilt in the fourteenth century. There is no old carved work either in the fourteenth-century roof of the nave or in the fifteenth-century roof of the choir: but some rudely-executed carving appears in the five remaining uprights of the chancel screen which have been reused in the restoration of the rood screen. However, the old church must have been rich in carved work, both in stone and wood, for parts of carved seats, screens and some sculptured figures have been dug up from under the floors.

The greatest care has been exercised to retain everything of mediæval interest, but much had been wholly destroyed or carried away. No old tracery remained in any of the windows. The east window of the south choir aisle has been restored from four pieces of tracery found buried in the wall in a corner of the building, which had long been utilised as a lumber corner by the caretaker. The roofs have been repaired

in situ, and many were the owls' nests that were removed from the chancel.

The pavements of the chancel and Lady Chapel are of variously-coloured marbles. The roofs have been panelled and enriched with carving, parts being picked out in gold. The sanctuary walls have been panelled in the best oak, the tracery being surmounted with a cove.

The rood screen consists of a series of niches, with gilt canopies, the whole being crowned with deep cresting. At the back of the richly-carved stalls are the remains of the valuable fourteenth-century parclose screens, which have been most carefully repaired. The vicar's desk-end is cut out of a solid piece of oak 6in. thick. The top, or "poppy head," is treated in an original manner, and has a dove with a shaving in its beak, the emblem of St. Crantock, enclosed in pierced foliage work. The fourteen stalls have carved misereres. The high altar is panelled, which terminates in a series of vine-leaved canopies. The Lady Chapel altar is a restoration of the original stone one. The front consists of tracery and carving in white alabaster.

The form of the new rood screen is founded on the six shafts that were found *in situ* in recent years surmounted by large painted balls, which were placed there as terminals. The screen is of thirteen bays, and has the fan-shaped cove projection about 2ft. The

balcony has been made more open in effect, in order that the east window, with its coloured glass, may be seen through it. In the niches are fourteen saints, the canopies over being gilt. The rood figures were carved in Germany by a craftsman who takes part in the "Passion Play." Only two carved oak desks have as yet been placed in the nave, but it is intended to replace the chairs with carved bench ends of mediæval form. A well-cut figure of the patron saint fills a niche in the north wall opposite the south door, the work of Mr. Hitch, of London, who also carved the Calvary in the transept gable. The carved woodwork is by Mr. Rashleigh Pinwill, of Plymouth. The building has been carefully repaired and restored by Mr. Nicholls, near Launceston, under the direction of Mr. Sedding.

A New Liberal Club at Bulwell is being erected in Highbury Road, which will involve an outlay of about £2,000. Mr. W. B. Starr, of St. Peter's Gate, Nottingham, is the architect, and Messrs. John Hutchinson & Son, of Gordon Road, Nottingham, are the contractors. The building will be two storeys in height and will be constructed of bricks, with stone dressings and a tiled roof. The entrance will be at the side, the hall being 17ft. by 12ft. On the ground floor will be a billiard-room, measuring 46ft. by 23ft., and in the basement underneath will be a skittle-alley of the same dimensions, together with eating-rooms and the cellars. There will also be on the ground floor the bar, the reading-room (17ft. by 13ft. 6in.), cloak-room, &c. On the first floor will be the assembly hall, which will accommodate about 300 persons; in addition to which there will be committee and retiring rooms. Provision will also be made for a caretaker, whose apartments will be at the rear of the club premises and approached through a passage on the ground floor.



COTTON SPINNING MILL AT LILLE, FRANCE (FERRO-CONCRETE CONSTRUCTION).



COLD STORES AT SOUTHAMPTON: CONSTRUCTION OF THE FIRST FLOOR.

Keystones.

Rodin's "Pensée."—The Luxembourg Museum has received the work by Rodin called "Pensée," representing the head of a young woman emerging from a block of white marble.

Mr. A. H. Christie, who has been appointed by the Technical Education Board of the London County Council as Inspector of Art Schools and Classics, is a professional designer of furniture, upholstery, metal work, wallpapers, &c. He has been employed as teacher of design at the Council's Central School of Arts and Crafts, and has had a considerable experience in connection with art education in London.

Burns's Cottage.—A serious fire, which for some time threatened to include Burns's cottage at Alloway, took place there on Thursday last, when a block of four thatched cottages situated on the public road directly opposite Burns's cottage were burned to the ground. Fortunately the wind was not blowing in the direction of the cottage; otherwise, being also thatched, it would have been impossible to save it. The damage to the buildings, estimated at about £1,000, is covered by insurance. The fire originated in one of the chimneys.

New Washing-Houses in Dundee were opened last week. They are situated at Constable Street and at Caldrum Street. The accommodation consists of forty washing-stalls, each provided with two washtubs, a boiling tub, a wringer and a drying-horse; a blanket-room with six drying-horses; a mangle-room with two mangles, and the other necessary apartments—office, waiting-room, boiler-house accommodation, &c. On the floor above there are eighteen bath-rooms. The total cost of the washing-houses and baths at Caldrum Street was £5,746.

Devon and Exeter Architectural Society.—At the invitation of Mr. Silvanus Trevail, F.R.I.B.A., the members of this Society recently paid a visit to Truro. The new stone viaducts to the east of the station, which are to replace the picturesque but antiquated wooden structures, first claimed attention (Messrs. Relf & Son, of Plymouth, executed the work). Visits were afterwards paid to Kenwyn Church, the Passmore Edwards Free Library and County Technical Schools (designed by Mr. Trevail), St. Mary's Wesleyan Chapel and School, the Royal Institution of Cornwall, and, lastly, to the Cathedral work. Luncheon was provided later at Mr. Trevail's house in Lemon Street.

New Synagogue and Schools at Hull.—These buildings are proposed to be erected on a site in Osborne Street. Messrs. Ansell & Cox, of Hull, are the architects. The synagogue is to be built at the north end of the site, and will be a large building, with seating accommodation for 500 persons on the ground floor, and 300 persons on the galleries. The schoolrooms, vestry, large hall, &c., are to be erected at the front of the site. These buildings will contain a vestry, several good classrooms, entrance halls, staircases, ladies and gentlemen's lavatories, and side entrances on the ground floor, also a large assembly hall (60ft. by 32ft.) on the first floor and two good club-rooms on the second floor.

A New Wesleyan Church at Durham is being built on a site adjoining the Shire Hall in Old Elvet. The church is in the Decorated style, with a tower and spire rising to a height of 100ft. It consists of nave, transepts, choir and organ-chamber, and will have accommodation for about 500 persons on the ground floor, including the choir, and 120 in the gallery, which is placed at the front end of the church. There is direct access from the church to the school, which consists of an assembly room with infants' room and classrooms grouped around. The scheme also comprises a ladies' room, kitchen, vestries and a large guild room, the last-named on an upper floor. Ample lavatory accommodation is provided. The interior woodwork of the pews and open wagon-headed roof will be pitch-pine. The tracery windows, filled with ornamental leaded lights, form a pleasing feature of the design. The cost of the buildings will be about £7,200. Messrs. W. J. Morley & Son, of Bradford, are the architects.

The Rhodes Memorial Fund now amounts to £3,800.

A New Organ has been built by Messrs. Hele & Co., of Plymouth, for St. James's Church, Torpoint.

The Failure of Mr. Frederick Goodall, R.A., was announced at the London Bankruptcy Court last week.

Gladstone Memorials.—On Wednesday last the last of the series of memorials to Mr. and Mrs. W. E. Gladstone at St. Matthew's Church, Buckley, were dedicated. Last year a chancel was erected in memory of Mr. Gladstone. Wednesday's dedication had reference to a baptistery, a window, a peal of eight bells, a new porch and a clock.

No Statuary for Blackfriars Bridge.—The Bridge House Estates Committee of the Corporation of London, to whom the question was referred of completing the original design of Blackfriars Bridge by the erection of suitable statuary on four pedestals of the bridge in commemoration of the coronation of His Majesty, reported last week to the Corporation that they were advised by the law officers that the funds of the estate could not be used for such a purpose. The reference to the committee was discharged.

A New Church at Derby is being erected for the district immediately surrounding Shaftesbury Crescent. The building will be of brick with facings of Matlock stone. The walls are of best red pressed bricks, and above the damp course are a few layers of Welsh bricks, which will assist in the prevention of damp rising. The roof is of open woodwork, the lining of ornamental work being of pine. Over the match-board lining is to be placed a layer of felt and then the slates. The church will be well-lighted and there will be a spacious organ chamber and a good chancel. The architect is Mr. E. R. Ridgway, of Long Eaton, and the contractors are Messrs. Walker & Slater, of Derby.

The Royal Archaeological Institute held its annual meeting at Southampton last week. Lord Montague, the president of the meeting, said that while much had been done to preserve the old walls at Southampton and make them more accessible, he could not help thinking that they could be further opened up and that the various erections placed against them should be removed. From an æsthetic point of view it was a pity that there was likely to be a railway so close to the walls which would spoil very much the view that was now obtained from them. He also regretted that a tram line should have been brought through the magnificent Bargate, and he viewed with disfavour the erection of buildings which had shut out the view from the town quay. At the same time, other things had been excellently preserved, notably Tudor House—in that case by private munificence.

New Buildings in Durban, Natal.—Amongst the many new buildings just erected in Durban, largely due to the impetus given by the late war, are the printing works of Mr. G. A. Riches, immediately opposite to St. Cyprian's church. The building is three storeys high and is designed in the Italian Renaissance style. The main pilasters are of the Corinthian order, the whole surmounted by a bold cornice and massive balustrades. The feature of the building is, perhaps, the angle tower, which is surmounted by an octagonal domical lantern. The architect was Mr. Arthur Fyfe, of Durban. The brick and stonework have been carried out by Messrs. Cornelius & Hollis; the joinery by Mr. J. B. McCarthy; the plumber's work by Messrs. Allanson & Summer, whilst Mr. S. P. Smith has been responsible for the painting and glazing. The modelling of the ornamental plasterwork is by Mr. Paul Knowbech. The flat fireproof roof is laid with Hansler's vulcanite cement, for which Mr. R. R. Muller, of Durban, is the local agent. In a niche in the tower stands a life-size female statue in Portland stone, symbolical of the engraver's craft. It is from the studies of Messrs. Harry Hems & Sons, of Exeter.—Amongst other prominent premises recently erected in Durban may be noted the new Durban Club, the Esplanade Buildings and the Marine Hotel—all of which have main frontages to the Indian Ocean—whilst extensive premises are at present being erected in Gardiner Street for Messrs. Beningfield & Sons, as well as for Messrs. S. Butcher & Sons, in West Street.

At St. Mary's Church, Wallingford, an alabaster altar rail and steps have been added in memory of the late Mr. Hedge.

Hall-itch-Wood, near Bolton, was formally opened as a technological museum on Wednesday last by Mr. W. H. Lever.

A Roman Catholic Church at Shirehampton is to be built at a cost of about £3,000. The architect is Mr. D. Webb, of Salisbury.

St. Anne's New Roman Catholic Cathedral at Leeds, which, with the school buildings, is to cost £78,000, is rapidly rising, and on Saturday the "first" corner stone was laid.

Aldershot Municipal Buildings Competition.—The Aldershot Council has decided to adopt the plans to which the first prize was awarded by the assessor. These plans were submitted by Mr. C. E. Hutchinson, of Bedford Row, London. The second premiated designs were by Mr. Thomas Davison, A.R.I.B.A., and the third by Messrs. Coggin & Wallis, both of London.

The Royal Aquarium, which has been purchased out of the Wesleyan Twentieth-Century Fund, was opened in January, 1876. The site measures 100,000 sq. ft., 40,000 sq. ft. of which will be used for the erection of a large building containing a hall to accommodate 3,000 persons, another to seat 1,000 persons, provision for a library and a home for the various departments of Methodism.

New Church of St. Peter, Birmingham.—The Bishop of Worcester recently consecrated the new church of St. Peter, which has been erected in George Street West at its junction with Spring Hill, Birmingham. Mr. Frank Barlow Osborn is the architect. The style is Early Perpendicular, and the materials used are red brick internally and externally, with Hollington stone arcades, windows and dressings, the roofs being covered with tiles. Messrs. W. Sapcote & Sons, of Birmingham, were the contractors.

R.I.B.A. Examinations.—The number of failures in each subject of the Final Examination recently held by the Royal Institute of British Architects was as follows:—

I. Design	-	-	-	23
II. Mouldings and Ornament	-	-	-	18
III. Building Materials	-	-	-	16
IV. Principles of Hygiene	-	-	-	10
V. Specifications	-	-	-	8
VI. Construction, Foundations, &c.	-	-	-	15
VII. Construction, Iron and Steel, &c.	-	-	-	16

In the pass list given on p. 370 of our last issue the name of Mr. Alfred C. Bossom was erroneously spelt "Bosson."

The Disaster at All Souls' Church, Langham Place.—In connection with the fatal accident which occurred on July 10th at Langham Place through the falling of a piece of coping from the balustrade of All Souls' Church, the Building Act Committee of the London County Council report that they have given instructions for the recommendations of the coroner's jury to be noted for consideration in connection with the general question of the amendment of the London Building Acts. The structure has been surveyed in pursuance of powers relating to dangerous structures, and arrangements are being made for the removal of the greater part, if not the whole, of the balustrades, and for replacing them in Portland stone.

A Twentieth-Century Portfolio.—We give this name to the portfolio issued to architects by the Burmantofts Company because it is so essentially the product of the very latest enterprise and skill in production. The issue of trade catalogues is frequent enough to discount somewhat heavily the best attempt at originality or excellence, and the Burmantofts Company has wisely refrained from issuing a catalogue. The book before us is rather a representation of what the Company has really done in various parts. It measures 21in. by 17in., and is bound in olive-green leather, with the Burmantofts' monogram on the front. There is first one page of introductory matter, relating to faience, vitreous glazed terra-cotta and glazed bricks, and then the photographic illustrations are left to speak for themselves: they are of work executed throughout the United Kingdom, and include banks, insurance buildings, hotels, Turkish baths, museums and all kinds of public buildings. The volume is very well produced (in Leeds) and reflects great credit on the Burmantofts branch of the Leeds Fireclay Company.

FIREPROOF CONSTRUCTION UNDER THE LONDON BUILDING ACTS.

The Evidence of Two City Surveyors.

AT the continued hearing last Wednesday of the enquiry into the fatal fire in Queen Victoria Street Mr. E. Woodthorpe, architect and district surveyor for the northern division of the City, said he went over the premises in question the morning after the fire, and was surprised that so little damage had been done to the structure. He came to the conclusion that there must have been some very inflammable materials inside. The provisions of the Building Act with regard to the protection of life from fire were few and inadequate. As far as he could see no statutory provision was contravened in the construction of the building. A man could put a "dormer" on the slope of a very high roof, from which dormer anyone

would tumble into the street, and he would comply with the Act; and the Act only applied to a building having a parapet. There were many high buildings which were veritable death traps; and some alterations in the Acts, and stringent regulations, ought to be made. The Act of 1894 was not retrospective. There must be hundreds of buildings in the City and thousands in the Metropolis to which the Act did not apply. Section 63, as to the provision of means of escape in high buildings, was excellent, but it applied only to a few cases. The County Council had done an immense amount of good in seeing the regulations carried out, and had made themselves unpopular by doing so.

Mr. Avory: Your know the Council have no inspectors to go round to see whether buildings are factories or not? Witness: Yes. The only inspectors are those of the Home Office, and the Council cannot move in regard to a building until it is reported to them as a factory. Fire-

prevention legislation requires revision, and must be made retrospective.

Mr. E. Power, district surveyor for the southern division of the City, said that in 1889 two openings in the party walls were made between No. 67 (the scene of the fire) and No. 69, Queen Victoria Street. He enquired about this, and was told that the buildings were in one occupation. He said, "What about No. 67?" and was told that Murdoch's Nephews (the occupants of the ground floor and basement of No. 67) were tenants of the General Electric Company. He replied that in that case the work could be done, and it was done, and was included in his return to the County Council. There was a lot of matchboarding in the building. He could not object to the construction under the Act of 1894. He further said he thought the exit on the roof was not sufficient, and that there should be a fireproof staircase from the top of the building to the bottom, but he had no power to require this.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
July 31	Manchester—Shed	Watch Committee	W. H. Talbot, Town Hall, Manchester.
" 31	Truro—Alterations to Isolation Hospital	City Council	M. Lea, City Surveyor's Office, Truro.
" 31	Ealing—Lodge	Town Council	O. Jones, Engineer and Surveyor, Town Hall, Ealing, W.
" 31	Kensington—Alteration and Enlarging Workhouse	Guardians	E. Flint, 80 Coleman Street, E.C.
" 31	Southampton—Telegraph Office	Commissioners of H.M. Works, &c.	H.M. Office of Works, &c., Storey's Gate, S.W.
" 31	Darlington—Houses .. .. .	.. .. .	W. Y. Dixon, Estate Office, Baltic Chambers, West Hartlepool.
" 31	Treacastle, Brecon—Chancel, &c.	Vicar of Triangles	D. T. Isaac, Ruperra House, Brecon.
" 31	Bower—Renovation of Parish Church .. .. .	.. .. .	John Robertson, Architect, Inverness.
" 31	Stonehaven—Additions to Mackie Academy	Governors	Kelly & Nicol, 367 Union Street, Aberdeen.
" 31	Peterborough—Extension of Generating Station	Electrical Committee	John O. Gill, Municipal Offices, Peterborough.
" 31	Crosland Moor—Two Houses .. .. .	.. .. .	Arthur Shaw, Architect, Golcar.
" 31	Bradford—Baths and Public Hall	Corporation	City Architect, Chapel Lane, Bradford.
" 31	Bargoed—Schoolroom .. .. .	.. .. .	Rev. D. Leyshon Evans, 21 Bristol Terrace, Bargoed.
" 31	Bethesda—School .. .. .	.. .. .	John Jones, Bethesda.
" 31	Blaenrhondda—Chapel .. .. .	.. .. .	J. Rees, Architect, Pentre.
Aug. 1	Carlisle—Grand Stands, &c.	Race Stand Co., Ltd.	J. Graham, Architect, Bank Street, Carlisle.
" 1	Brentwood—Fire Station	Urban District Council	J. E. Fothergill, Surveyor, Town Hall, Brentwood.
" 1	Rotherham—Extensions to Generating Station	Corporation	J. Platts, High Street, Rotherham.
" 1	Nottingham—Stables and Cottage	Corporation	Arthur Brown, Guildhall, Nottingham.
" 1	Loughborough—Boiler-house, &c.	Town Council	Edward Oaions, Gasworks, Loughborough.
" 1	Hull—Foundations in Victoria Square	Corporation	Joseph H. Hirst, Town Hall, Hull.
" 2	Helmsley—Widening Shaken Stone Bridge .. .. .	.. .. .	W. G. Bryning, Surveyor, Northallerton.
" 2	Oxford—Alterations to Sonning Bridge	County Council	H. J. Tollit, County Surveyor, Oxford.
" 2	Roscommon—Residence, &c.	Guardians	T. J. O'Keefe, Workhouse, Roscommon.
" 2	Strensall—Six Houses .. .. .	.. .. .	Albert Green, Strensall.
" 2	Windsor—Cemetery Wall	Town Council	Borough Surveyor, Windsor.
" 2	Henshaw—Two Cottages .. .. .	.. .. .	N. J. Makepeace, Ramshaw Field, Bardon Mill.
" 2	Edenderry—Repairs	District Council	H. B. Waters, Civil Engineer, Edenderry.
" 2	Camborne—Erection and Completion of Residence .. .. .	.. .. .	H. W. Collins, Architect, Walseldon, Redruth.
" 4	Dundalk—Stores Building	Great Northern Railway Co. (Ireland)	Engineer-in-Chief, Amiens Street, Dublin.
" 4	Seaford—Boundary Wall	Urban District Council	B. A. Miller, 3 Clinton Place, Seaford.
" 4	Larne—Urinals	Urban District Council	W. G. Yonge, Town Hall, Larne.
" 4	Bishop's Stortford—Additions to Isolation Hospital	Hospital Joint Committee	E. T. Watts, Surveyor, Thorley, Bishop's Stortford.
" 4	Todmorden—Mortuary and Conveniences	Town Council	O. R. Pease, Town Hall, Todmorden.
" 4	Leeds—Brewhouse, &c., at Central Station Hotel .. .. .	.. .. .	Thomas Winn & Sons, Architects, 92 Albion Street, Leeds.
" 4	Slough—Three Cottages	County Council	R. J. Thomas, County Hall, Aylesbury.
" 5	Chester—Alterations to Upton Asylum .. .. .	.. .. .	H. Be-wick, County Architect, Chester.
" 5	Castlereagh—Villa .. .. .	.. .. .	J. V. Brennan, Architect, Belfast Bank Obbs., Castlereagh, co. Down.
" 5	Tottenham—Fire-Station Depot Buildings, &c.	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
" 5	St. Stephens-by-Saltash—School Buildings	School Board	W. J. Carder, 8 Athenaeum Terrace, Plymouth.
" 5	Burnham-on-Crouch—Engine House	Urban District Council	E. Dillway, High Street, Burnham-on-Crouch.
" 5	Sleaford—School	High School Directors	J. Olere, Architect, Sleaford.
" 6	Bradford—Store and Three Houses	Co-operative Society, Ltd.	W. Rycroft, Architect, Bank Buildings, Manchester Road, Bradford.
" 6	Kinsale—Fourteen Cottages	Rural District Council	R. Evans, Engineer, 53 South Mall, Cork.
" 6	Merton, Surrey—Parish Offices	Parish Council	H. G. Quartermain, Merton Park.
" 7	Aman—School	Aberdare School Board	T. Roderick, Clifton Street, Aberdare.
" 7	Firsby—Chapel .. .. .	.. .. .	H. Smith, Firsby, near Sleaford, Lincs.
" 7	Southend-on-Sea—Cookery Centre	School Board	W. Y. Hobbs, 57 High Street, Southend-on-Sea.
" 9	Yeovil—Dwelling-house	Rural District Council	No. 30 Kingston, Yeovil.
" 9	Hertford—Alterations to Lodge at Workhouse	Guardians	Russell Austin, 13 Villiers Street, Hertford.
" 11	Northallerton—Extensions to Shed Premises	J. Wilfrid & Sons	Thomas Winn & Sons, 92 Albion Street, Leeds.
" 11	Chesterfield—Infirmary, Nurses' Home, &c.	Union Guardians	Rollinson & Son, 13 Corporation Street, Chesterfield.
" 11	Bishop's Stortford—Boundary Wall	Gas Company	Manager at the Works, Bishop's Stortford.
" 11	Tywarreath, Cornwall—Schools	School Board	W. J. Samble, Hill House, Par Station, Cornwall.
" 12	Cahir, co. Tipperary	New Crown Post Office	H. Williams, Office of Public Works, Dublin.
" 12	Ipswich—Inland Revenue Office	Commissioners	H.M. Office of Works, Storey's Gate, Westminster, S.W.
" 12	Manchester—Joiners' Work and Tiling New Baths	Corporation	General Superintendent, Osborne Street Baths, Manchester.
" 14	Barnes—Infants' School	School Board	O. Jones, 50 Cannon Street, E.C.
" 15	Pontypridd, Mon.—Buildings, &c., at Electric Station	Urban District Council	Reginald P. Wilson, 66 Victoria Street, Westminster, S.W.
" 15	Mullingar—College	Rev. Dr. Gaffney	J. J. O'Callaghan, 16 Nassau Street, Dublin.
" 16	Swadlinote Baptist Church—Enlargements .. .. .	.. .. .	C. Coulton, 68 Oxford Street, Church Gresley.
" 18	Aberavenny—Stone Bridge and Wall	Rural District Council	John Gill, 4 Brecon Road, Aberavenny.
" 18	Cardiff—Basements, Foundations, &c., at Asylum	Corporation	Oatley & Skinner, Edinburgh Chambers, Baldwin Street, Bristol.
" 27	Newport, Mon.—Lunatic Asylum	Corporation	Borough Engineer, Town Hall, Newport, Mon.
ENGINEERING:			
July 31	Stadthorpe, Yorks—Widening Railway	North-Eastern Railway Co.	W. J. Cudworth, Company's Engineer, York.
" 31	Ramsgate—Sea-Defence Works	Corporation	T. O. Taylor, Borough Surveyor, Albion House, Ramsgate.
" 31	London, S.W.—Self-propelled Lorry	War Office	Director of Army Contracts, War Office, Pall Mall, S.W.
" 31	Pontypridd—Electrical Cables, &c.	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
" 31	Barton, Lancs—Electric Lighting .. .. .	.. .. .	E. O'Shaghnessy, 66 Hammonde Terrace, Padham.
" 31	Vigo, Spain—Water Supply .. .. .	.. .. .	Commercial Intelligence Branch, Board of Trade, 50 Parliament St.
" 31	Farnworth, Lancs—Engine, &c.	Urban District Council	J. D. Pember, Electricity Works, Albert Road, Farnworth.
" 31	Chilworth, near Guildford—Reservoir	Rural District Council	E. S. Courtney, Broad Sanctuary Chambers, Westminster, S.W.
" 31	Leeds—Water Tanks	City Council	City Engineer's Office, Leeds.
" 31	Truro—Electric Lighting	Electric Lighting Committee	City Engineer's Office, Truro.
" 31	Manchester—Heating Police Station	Corporation Watch Committee	R. Dobell, Town Clerk, Truro.
" 31	Hambleton—Covered Reservoir	Rural District Council	City Architect, Town Hall, Manchester.
Aug. 1	Crofton to Shafton, Yorks—Construction of Railway	Lancs and Yorks Railway Co.	E. S. Courtney, Broad Sanctuary Chambers, Westminster, S.W.
" 1	Dundee—Machine Tools, &c.	Gas Commissioners	Engineer, Hunt's Bank, Manchester.
" 2	Manchester—Switches	Tramway Committee	Walter H. Tittensor, Dudhope Crescent Road, Dundee.
" 2	Dorchester—Waterworks	Rural District Council	J. M. McIlroy, 55 Piccadilly, Manchester.
" 4	Upholland—Headgear at Pumping Station	Urban District Council	F. W. Mager, Civil Engineer, Alaridge, Walsall.
" 5	Richmond, Surrey—Motor Truck	Main sewerage Board	Surveyor, Council Offices, Upholland.
" 5	Westport—Piling at Steamer Shed	Harbour Commissioners	Main Drainage Works, near New Gardens Station.

COMPLETE LIST OF CONTRACTS OPEN—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
ENGINEERING—cont.:			
Aug. 6	Hove—Sea-Wall Improvement	Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 6	Herne Bay—Excavating, Piling, &c., for Pavilion	Urban District Council	F. W. J. Palmer, Town Hall, Herne Bay.
" 7	King William's Town, South Africa—Plant	King Electric Lighting and Cold Storage Co., Ltd.	A. E. Booth & Co., 16 New Union Street, Moorfields, London E.C.
" 7	Ware—Lighting Streets	Urban District Council	G. H. Gisby, Town Hall, Ware, Herts.
" 9	Bethesda, Wales—Waterworks Alterations, &c.	Urban District Council	D. G. Davies, Clerk, Bank Chambers, Bethesda.
" 9	Clown Chesterfield—Sewer	Rural District Council	E. Hazledine-Barber, Engineer, Hollin Hill, Clown.
" 11	Cardiff—Dredger	Cardiff Railway Co.	Henry Ree, Engineer to the Company, Bute Dock, Cardiff.
" 15	London, S.W.—Economisers	County Council	County Hall Spring Gardens, S.W.
" 19	Iford—Tramway Watering Car	Urban District Council	W. O. O. Hawtayne, 9 Queen Street Place, London, E.C.
" 21	Selangor, Malay States—Electrical Plant and Materials	Crown Agents for Colonies	Crown Agents for the Colonies, Downing Street, S.W.
" 21	Ilkeston and Heanor—Waterworks	Urban District Council	G. & F. W. Hodgson, Engineers, Loughborough.
" 23	Colchester—Alterations to Pumps	Town Council	O. E. Bland, Town Hall, Colchester.
" 23	Malvern—Electricity Supply Works	Urban District Council	H. P. Maybury, Engineer, Council House, Malvern.
" 24	London—Dredging Thames	Conservancy	Thames Conservancy Offices, Victoria Embankment, E.C.
Sept. 1	Valparaiso, Chile—Electric Tramways	Tramway Committee	Chilian Consulate, 10 Lime Street, E.C.
" 3	Leicester—Electric Tramway Works	Harbour Trustees	E. G. Mawbey, Town Hall, Leicester.
" 4	Swansea—Hydraulic Accumulators, &c.	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
" 4	Swansea—Drawbridge	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
" 14	St. Petersburg, Russia—2 Bridges over River Neva	Mayor and Aldermen	The Delegation Municipale, St. Petersburg.
" 15	Launceston, Tasmania—Electric Power Transmission Extensions	Ministry of Public Works	J. Terry & Co., 7 Great Winchester Street, E.C.
" 15	Cairo—Widening Canal	Inspector of Irrigation, Projects Circle, Minia.	
" 30	Port Adelaide, South Australia—Harbour	Agent-General for South Australia, 1 Crosby Square, London.	
IRON AND STEEL:			
July 31	London, E.C.—Ironmongery, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 31	Dewsbury—Cast-iron Pipes, &c.	Lighting and Water Committee	O. A. Craven, Gasworks, Savile Town, Dewsbury.
Aug. 1	Roston—Fence	Burial Board	W. H. Wheeler, C.E., Market Place, Boston.
" 2	Windsor—Fencing around Cemetery	Town Council	Borough Surveyor, Windsor.
" 5	Aldershot—Fencing, Wall, &c.	Urban District Council	Nelson F. Dennis, A.M.I.C.E., Aldershot.
Sept. 1	London, S.W.—Rails and Fishplates	Municipality	Agent-General for Victoria, 15 Victoria Street, S.W.
No date.	Johannesburg—Manhole Covers, Columns, Joists, &c.		E. W. Carling & Co., St. Dunstan's Bldgs., St. Dunstan's Hill, E.C.
PAINTING AND PLUMBING:			
July 31	Glasgow—Painting Works	Corporation	Office of Public Works, 64 Cochrane Street, Glasgow.
" 31	Llandudno—Paints, Oils, &c.	Urban District Council	A. Shelley, Town Offices, Littlehampton.
" 31	London, E.C.—Plumber and Gas Fitter's Stores, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment E.C.
Aug. 1	Cambridge—Painting	Market Committee	Borough Surveyor, Guildhall, Cambridge.
" 1	Hastings—Painting Greenhouses, &c.	Corporation	P. H. Palmer, Town Hall, Hastings.
" 1	Salford—Painting Workhouse	Guardians	F. Townson, Union Offices, Eccles New Road, Salford.
" 9	Poplar, E.—Painting, &c., at Town Hall	Borough Council	Harley Heckford, Council Offices, High Street, Poplar, London, E.
" 11	Jarrow—Repairing Lamps	Urban Sanitary Authority	Borough Surveyor, Aeca House Jarrow.
" 11	Leeds—Painting at Municipal Buildings	Corporation	City Engineers, Town Hall, Leeds.
ROADS AND CARTAGE:			
July 31	Ealing—Kerbing	Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.
" 31	Wanstead, Essex—Paving	Urban District Council	O. H. Brassey, Surveyor, Council Offices, Wanstead.
" 31	Baldon, Yorks—Limestone	Urban District Council	J. Bentley, Clerk, Baldon.
" 31	Bandon—Maintenance of Roads	Rural District Council	A. Haynes, Council Room, Bandon Workhouse.
" 31	Harrow—Making up	Urban District Council	J. Percy Bennetts, Council's Engineer, Harrow.
Aug. 2	Littlehampton—Steam Rolling	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
" 2	Littlehampton—Flints	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
" 2	Chard—Steam Rolling	Rural District Council	R. Stephens, District Surveyor, Ilminster.
" 2	Droxford—Haulage	Rural District Council	F. Clark, Clerk to the Council, Busnop's Waltham.
" 2	Ramsbottom—Forming Street	Urban District Council	T. H. Bell, Council Offices, Ramsbottom.
" 2	Walmer—Quartzite	Urban District Council	H. W. Barker, Surveyor, Walmer.
" 4	Bishop Auckland—Making-up	Rural District Council	O. Johnston, Crofton House, Bishop Auckland.
" 6	Epsom—Making-up	Rural District Council	T. E. Ware, Surveyor, Waterloo Road, Epsom.
" 6	Hove—Granite Kerbing	Borough	H. H. Scott, Town Hall, Hove.
" 6	Little Wootton—Macadam, &c.	Urban District Council	Council's Surveyor, Grange Lane, Gatacre, near Liverpool.
" 7	Wanstead, Essex—Granite Edge Kerb	Urban District Council	O. H. Bressay, Surveyor, Council Offices, Wanstead, N.E.
" 11	Hitchin—Granite	Urban District Council	Council Offices, Town Hall, Hitchin.
" 11	Iford—Levelling Roads	Urban District Council	Surveyor, Town Hall, Iford.
" 11	Loughborough—Laying S'abs	Town Council	A. H. Walker, Town Hall, Loughborough.
" 12	Coveentry—Making-up	Corporation	J. E. Swindlehurst, St. Mary's Hall, Coventry.
SANITARY:			
July 31	Abingdon—Sewer	Corporation	G. Winship, Civil Engineer, Abingdon.
" 31	Truro—Sewer	Rural District Council	A. E. Preston, Engineer, Truro.
" 31	Whickham—Sewerage Works	Urban District Council	J. B. Kenton, Parish Offices, Whickham, Durham.
Aug. 2	Burton-on-Trent—Lime	Corporation	G. T. Lynam, Town Hall, Burton-on-Trent.
" 6	Stanley—Sewer	Urban District Council	F. Massie, Tetley House, Wakefield.
" 9	Clown, Chesterfield—Sewer	Rural District Council	E. Hazledine-Barber, Engineer, Hollin Hill, Clown.
" 11	London—Main Drain, &c., at Homerton Workhouse	Guardians	J. Johnson, 47 Mark Lane, E.C.
TIMBER:			
July 31	Dewsbury—Batten Ends	Guardians	Master of the Workhouse, Dewsbury.
" 31	Salford—Floor Boards	Town Council	Borough Engineer, Town Hall, Salford.
No date.	Birmingham—Timber	School Board	J. A. Palmer, School Board Office, Edmund Street, Birmingham.

COMPETITIONS OPEN.

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug. 1	Newtownards—Sewage Works Scheme	—	H. M'Cartney, Clerk to the Council, Newtownards (Ireland).
" 23	Clacton-on-Sea—School Board	—	O. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
" 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	O. H. J. Talmage, Southchurch Road, Warner Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 16	London, S.E.—Artizans' Dwellings	£100, £80, £40.	F. Ryall, Town Clerk, Bermondsey Town Hall, Spa Road, S.E.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.C. Offices, Tottenham.
" 29	Bideford—Municipal Offices and Public Library	£30, £15, £10.	W. E. Seaton, Town Clerk, 15 The Quay, Bideford.
Nov. 1	Alahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Alahabad, India.
No date.	Strathcona and S. Africa—Monument in Honour of Canadian Soldiers	—	F. Davidson, London and Laue Buildings, Montreal, or Bank of Montreal, 22 Abchurch Lane, E.C.
"	Bristol—Reference Library	—	E. J. Taylor, The Council House, Bristol.
"	Grantham—Cottage Home	£5 5s.	Town Clerk, Grantham.
"	Barry—Municipal Buildings	£150, £100, £50.	J. C. Pardoe, District Council Office, Barry.
"	Denby Dale, Huddersfield—Hall and Schools	[Rest. to Local Architects.]	G. W. Moxon, Denby Dale.

Builders' Notes.

Mr. Robert Ibbotson, a well-known builder, of Blackburn, died recently, aged 75. He erected the School Board Offices, the Orange Hall, St. Luke's Church and St. James's Church.

Australian Hardwood "Combine."—A scheme by which eight Western Australian companies engaged in the hardwood trade are combined was agreed to last week at a meeting of the Millar's Karri and Jarrah Forest Co.

A Russian Building Scheme that Failed.—A few years ago a Russian architect, with the help of English capitalists, floated a company under the name of New Petersburg. Its capital of 12,000,000 roubles was to be devoted to the building of a new and fashionable district, consisting of 800 six-storey mansions on the Neva island, Golodaj. The failure of the company has now been declared, and the sites already acquired on the island are to be sold by auction; but, whatever may be the proceeds of the sale, the losses of the shareholders will probably reach 5,000,000 roubles.

Builders' Benevolent Institution.—The annual meeting of this institution was recently held at the offices, 31 and 32, Bedford Street, Strand, Mr. J. Carmichael presiding. The committee in their report stated that there had been a continuation of the financial support they had received in the past. They hoped, however, to celebrate the Coronation by extending their benefactions, and that would require a larger income. There were now twenty-one men and twenty-seven women in receipt of pensions of £39 and £27 per annum respectively. Major Bruton, after acting as the secretary for twenty-seven years, was obliged to resign in consequence of bad health, and Mr. T. Costigan had been appointed his successor. Mr. W. Higgs was elected to fill the presidential chair for the year, in the place of Mr. Carmichael.

Master-Builders' Conference: The New Form of Contract.—The members of the National Federation of Building Trade Employers of Great Britain and Ireland held a conference at Brighton last week. Several important matters were discussed, amongst which was the proposed new form of contract about to be issued by the Institute of Builders, and the following resolution was adopted: "That the form of contract as issued by the Institute of Builders, and revised in order to afford opportunity (in the alternative) for the bills of quantities to form part of the contract, be adopted as the official form of contract for the National Federation." The recent law case, *Ford v. Bemrose*, was also considered, and the following resolution adopted: "That a committee, consisting of the president, vice-presidents and the presidents of the four centres be and is hereby appointed to take the best expert opinion obtainable on the case and report to the council as to the desirability of the Federation assisting Messrs. Ford & Co. to have the judgment of the Court of Appeal reviewed by the House of Lords."

Hull Municipal School of Art.—A tender of £12,058 for the erection of this building was accepted last week by the Municipal Art Committee.

Bedford Builders' Association.—At a recent meeting of this Association the election of officers resulted as follows:—President, Mr. R. Black; vice-president, Mr. Alfred Corby; secretary, Mr. R. Melcombe; treasurer, Mr. C. Negus; committee—Messrs. A. E. Pryor, B. Litchfield, sen., E. Casbeard, D. Francis, G. Harrison, F. Corby, J. Bartley, A. Connisbee, C. Melcombe and S. Freshwater. The membership fee was fixed at 5s. per annum, and the committee were instructed to formulate rules to be submitted to a general meeting. About forty builders have joined the Association.

The Eddystone-Aberthaw Lime and Cement Co., Ltd., has been formed by a syndicate of Liverpool gentlemen, and will shortly be placed before the public as a promising investment. The Aberthaw district is situated near Cardiff, on the Bristol Channel, and for centuries its name has been associated with the famous hydraulic lime produced from the pebbles found in such abundance on the beach there. Smeaton used Aberthaw lime in the building of his great masterpiece, the Eddystone Lighthouse, in 1756-9; while the Bell Rock Lighthouse is another notable structure in which this product has been used.

London County Council.—At last week's meeting of the Council considerable discussion followed on the reception of the Finance Committee's report. Mr. Beachcroft pointed out that in the agenda paper they found the Highways Committee recommending an expenditure of £2,500,000; the Improvements Committee, £334,000; the Main Drainage Committee, £200,000 (for two additional lines of sewers); the Parks Committee, £25,000 and £3,000 annually; the Asylums Committee, £9,000; the Fire Brigade Committee, £32,000 and a small item amounting to £2,500; while to finish up there was the proposal for a county hall involving an expenditure of £900,000. He only desired to ask the chairman of the Finance Committee whether his Committee could suggest some regulation to avoid the scandal of the Council being asked to commit itself to huge capital liabilities at practically the last meeting when it was impossible that they should be properly discussed. Mr. Cousins said that at the previous meeting, when he protested against the spending of a large sum of money for building car sheds by the Works Department without any plans or specifications, he was told his action would cause delay. It was an example of what constantly happened at the Council. Matters of very great importance were brought forward at the last sitting, and then they were threatened that if they discussed them it would be said at the polls they were obstructing important business. They were being asked to vote away 3½ millions of money with practically no opportunity of discussion.—The Bridges Committee reported upon a scheme for the erection of dwellings to rehouse the persons displaced by the construction of Rother-

hithe Tunnel. It was proposed to provide accommodation for 340 persons in sixty-five tenements. The amount available for their erection was £14,198, which left a capital deficiency on the erection of £1,398, to which must be added £1,000, the valuer's estimate of the value of the land. Lord Welby moved as an amendment to refer the matter back, "with instructions to advertise the land for sale or letting, and if no satisfactory offer was received to follow the recommendation proposed." This was agreed to.

WITTON HALL, BIRMINGHAM.

WITTON HALL is a three-storey red-brick house, Georgian in appearance, which has been altered so as to form the new home of the Penn Street Industrial School, Birmingham. The old floors are of oak, and some of the walls are lined with panelled-oak wainscot. An interesting feature is the old oak staircase with its moulded balustrade. In the alterations now completed, by removing several walls, &c., a large portion of the ground floor of the house-block has been converted into a dining-hall 48ft. by 19ft., and on the floor above a dormitory of similar dimensions has been constructed accommodating twenty-six beds. The remainder of the house is now used as the superintendent's residence. The old scullery-wing has been extended, its walls thickened and roof raised giving space on the ground floor for a new scullery, pantries, a boys' lavatory with twenty-four basins, and a bath-house containing a bath lined with glazed white bricks and measuring 17ft. 6in. by 6ft. 6in. and 3ft. deep. The upper storey has a dormitory 61ft. by 17ft. 6in. accommodating twenty-nine beds, and a sick-room with an independent staircase entrance for isolation, also a masters' bathroom. The stable wing has been cleared out and made to accommodate carpenters', shoemakers' and tailors' workshops, washhouse, laundry and store-room. A new wing has been erected on the south-east side of the house containing the schoolroom, 38ft. by 24ft. by 16ft. high, to be used also as a gymnasium, the principal staircase, and a dormitory over the schoolroom (38ft. by 24ft.) accommodating twenty-five beds. A one-storey wing has also been added containing the office for superintendent and committee and an officers' sitting room. A playground has been formed in the rear and a play-shed 64ft. by 16ft.; the latter will eventually be enclosed. The buildings are warmed by hot water on the low-pressure system, supplied by Messrs. Benjamin Parker, Ltd., of Birmingham, and automatic ventilators and fresh-air inlets have been arranged to give a good supply of fresh air. The contractors were Messrs. Mills & Son, of 35, Leopold Street, Birmingham. Mr. Freeman Smith, of 88, Colmore Row, Birmingham, was the architect. The Lord Mayor of Birmingham opened the building on Thursday, July 17th. Its total cost, including the freehold, has been £6,360.

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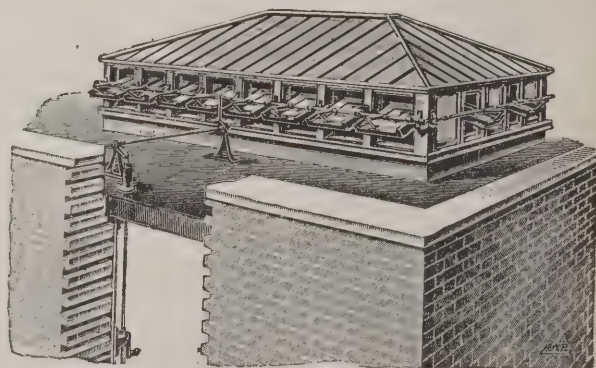
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TENDERS.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Effingham House Arundel Street, Strand, W.C.

BASFORD (NOTTS).—For additions, &c. to workhouse, for the Guardians. Mr. W. V. Betts, architect, Bank Offices, Old Basford:—

T. Cuthbert	£1,500 0
W. Savage	1,250 0
Hopewell & Son	1,250 0
J. Hutchinson	1,214 0
H. Ingham, Old Basford, Nottingham	1,209 14

* Accepted.

BIRMINGHAM.—For (Contract 31) work required in connection with the construction of carriers Nos. 1, 2, 4, 5, 8, 9, 10, and 11, and appurtenances on lands between Menworth and Curdworth on the sewage farm extension, for the Birmingham Tame and Rea District Drainage Board. Mr. J. D. Watson, engineer:—

C. H. Walker & Co., Ltd., Westminster	£25,153 16 10
T. Lowe & Sons, Burton-on-Trent	24,219 16 3
Curral, Lewis & Martin, Birmingham	23,240 6 0
Ridson & Son, Nottingham	22,231 0 0

* Accepted.

BRISTOL.—For the erection of a warehouse, for Messrs. T. Adams & Bro., Mr. W. H. Watkins, architect, Summerhill Road, St. George, Bristol:—

A. J. Beaven	£2,740
C. A. Hayes	2,588
Stephens, Bastow & Co., Ltd.	2,578
E. Love	2,560
H. W. & E. J. Neale	2,550
J. James	£2,498
G. Humphreys	2,400
Cowlin & Sons	2,433
W. & J. Bennett	2,420
T. B. Lewis	2,208

* Accepted.

CARDIFF.—For the supply of cast-iron socket-pipes, together with all irregulars and special castings that may be required for 12 months ending June 30, 1903, for the Corporation. Mr. C. H. Priestley, M.I.C.E., waterworks engineer:—

Stanton Ironworks Co., Ltd., Stanton, near Nottingham	£8,541 0 0
D. Y. Stewart & Co., Glasgow	6,531 18 0
D. M. Stevenson & Co., Glasgow	6,487 3 9
Macfarlane, Strang & Co., Ltd., Glasgow	6,342 15 6
J. & S. Roberts, Ltd., West Bromwich	5,956 0 0
Cochrane & Co., Dudley	5,774 7 6

* Accepted.

COCKINGTON.—For the completion of St. Matthew's Church, Cockington, for the Committee. Messrs. Nicholson & Corlette, architects, 5 New Square, Lincoln's Inn:—

T. Vanstone, Torquay	£3,274 2 5
H. C. Goss, Torquay	3,222 0 0
Stephens, Bastow & Co., Bristol	2,970 0 0

R. F. Yeo, Rock Road, Torquay	2,880 0 0
E. P. Hovey & Son, Torquay	2,740 0 0
A. J. Webber, Chelston, Torquay	2,600 0 0
W. Narracott, Dunolly, Cockington	2,580 0 0

DOLANOG (N. WALES).—For the erection of a memorial chapel. Mr. G. Dickens Lewis, architect, Talbot Chambers, Shrewsbury. Quantities by the architect:—

R. A. Jones, Llanfyllin	£1,183 0
E. C. Phillips, Newtown	1,083 0
E. H. Nicholas, Shrewsbury	957 12
M. J. Harris, Dolanog	945 0
W. H. Thomas, Oswestry	874 19

* Accepted. [Architect's estimate, £350.]

GILLINGHAM (KENT).—For the erection of 48 houses in Richmond Road, Gillingham. Mr. Ernest J. Hammond, C.E., M.S.A., architect, 111 High Street, New Brompton:—

E. Reeves, Cliffe, Rochester	£10,224
L. Seager, Sittingbourne	13,302
J. Wilford, Snodland, Kent	13,188
Myall & Co., Clifton-on-Sea	12,480
H. E. Phillips, Barnsole Lane, New Brompton	12,210
A. Candler, New Brompton	12,100
Kemp Bros., Rainham, Kent	11,950
H. Harris, New Brompton	11,857
A. S. Ingleton, Herne Bay	11,650
West Bros., Rochester	11,940

* Accepted.

HEMINGFORD GREY (HUNTS).—For the erection of a central school and master's house, &c. for the Hemingford Grey (Hunts) School Board. Mr. William Wood Bethell, architect:—

F. Giddings, St. Ives, Hunts	£3,850 0 6
Passen & Son, Earith, St. Ives	3,659 8 11
W. Howard, Huntingdon	3,600 0 0
G. Page, Buckden, Hunts	3,538 12 6
F. Markham, Godmanches'er, Hunts	3,519 0 0
Skeles Bros., St. Ives, Hunts	3,490 0 0
Allen & Sons, Hemingford Abbots, St. Ives	3,422 0 0
M. J. Allen, Brampton, Huntingdon	3,257 6 0
St. John & Son, St. Ives, Hunts	3,067 0 0

* Accepted.

HULL.—For the erection of the "First Baptist Church," The Boulevard, Hull. Mr. T. Brownlow Thompson, architect, 15 Parliament Street, Hull. General tenders not accepted:—

Anthony Lyons, Malton	£7,079 17 3
Bell & Kitchen	6,811 15 0
C. Richardson	6,510 10 0
Hull Joiners	6,218 0 0
J. Kemp	6,200 0 0
J. R. Woods	6,153 17 4
G. W. Stevenson	6,064 19 0
F. Bilton	6,138 14 8
W. Vickerman	6,100 0 0
E. Good & Sons	6,097 4 0
G. L. Scott	6,065 0 0
Hull General Builders	6,065 0 0
R. Finch & Co.	5,970 0 0
F. Beily	5,920 6 10
Simpson & Sons	5,918 0 0
M. Harper	5,887 10 0
H. Kay	5,700 11 0
H. Moody	5,699 7 10
Hebblewhite & Wilson	(Rest of Hull.)

Bricklayer & Plasterer.	
F. Bilton, Hull	£2,999 0 0
Morill & Son, Hull	2,937 0 0
G. R. Woods, Hull	2,880 4 6
Carr, Hull	2,484 13 3
Hull General Builders, Hull	2,430 6 0
H. Moody, Hull	2,247 14 0
H. T. Annett, Hull	2,171 9 7

Mason.	
F. Sweeting, Hull	£1,370 17 0
H. Drewery, Hull	1,200 0 0
G. Crawford & Co., Hull	1,135 0 0
G. H. Pantou, Hull	995 0 0
Simpson & Son, Hull	950 0 0
Christie Patent Stone Co., Hull	890 1 9

Joiner.	
G. L. Scott, Hull	£2,190 0 0
Simpson & Son, Hull	2,036 10 0
J. E. Train, Hull	1,480 17 6
J. Wilson & Son, Hull	1,920 10 0
H. Kaye, Hull	1,757 0 0
Hull General Builders, Hull	1,625 10 0

Plumber.	
G. W. Smith, Hull	£300 10 0
Henningsham, Hull	380 8 10
A. Johnson, Hull	360 0 0
Simpson & Son, Hull	350 0 0
W. L. Harrison, Hull	350 0 0
Hodgson, Hull	351 3 6
T. Hirst, Hull	352 0 0

Slaters.	
Hull General Builders, Hull	£299 7 6
Williamson & Co., Hull	267 13 0
Smith & Hunter, Hull	204 14 0

Painter.	
Hull Painters, Hull	£118 10 0
T. W. Bailey, Hull	114 8 10

* Accepted.

OLD TRAFFORD (MANCHESTER).—For buff terra-cotta required in the erection of public baths. Mr. Ernest Woodhouse architect, 58 Mosley Street, Manchester:—

H. R. Bowers	£1,030 13 10
Carter & Co.	975 0 0
Crossley & Sons	920 0 0
Walswick Colliery Co.	874 1 6
Doulton's, Ltd.	857 0 0
Hathern Station Co.	845 15 0
Coalville, Sandford & Alston	840 0 0
Burnantoffs Works	837 2 0
Gibbs & Canning	783 5 0
J. Thompson	746 17 0
Dennis-Ruabon	742 0 0
Bishop Hall Co.	732 2 9
Joseph Cliff & Sons	731 12 0
Staffordshire Brick Co.	700 13 1
J. E. Edwards	692 0 0

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IN RELIEF

DECORATIONS



MAIDENHEAD.—Accepted for the erection of a riverside villa on The Fishery Estate, for Mr. F. H. Grove. Messrs. Paigne & Co., architects, Westminster:—
Belcher & Co., Ltd., St. Andrew's Hill, Queen Victoria Street, E.C.

LONDON, W.—For alterations, &c. to the West End Baptist Church and Schools, Hammersmith, W. Messrs. G. Baines & Son, architects, 5 Clement's Inn, W.C.:—
J. Polden £1,328 15 0
Collingwood & Co., 1,158 15 0
* Accepted.

LONDON, W.C.—For pulling down sheds, &c. at 245 Gray's Inn Road, W.C., and erection on the site of stabling for 64 horses on the first floor and cart sheds under, &c. Messrs. Hayward & Maynard, architects:—
T. G. Hawkins £4,066
W. J. Negus £3,066
H. & E. Lee 3,908
A. J. & C. Hocking 2,900
Patman & Fotheringham 2,409
* Accepted.

LONDON, S.W.—For certain alterations and additions at 14 Hans Place, S.W., for Mr. J. T. Smith. Messrs. Walton & Lee, surveyors, 10 Mount Street, Grosvenor Square, W. Quantities by Mr. H. H. Robinson, 8 New Court, Lincoln's Inn:—
Holloway Bros. £3,218
J. Carmichael £2,918
Thompson & Beveridge 3,047
Wallace & Co. 2,900
Simpson & Sons 2,970
Simpson & Co. 2,800
Turtle & Appleton 2,900

PENTREFFELIN (N. WALES).—Accepted for the erection of a minister's manse. Mr. G. Dickens-Lewis, architect, Talbot Chambers, Shrewsbury:—
R. A. Jones, Llanfyllin £363

RHIWFELEN PAWR (near LLANTRISANT, WALES).—For the erection of an isolation hospital for the Llantrisant and Llantwit Fardre Rural District Council. Mr. Gomer S. Morgan, surveyor, Pontyclun:—
Lattey & Co., Ltd., Cardiff £8,075 0 0
J. Allan & Sons, Cardiff 8,050 0 0
Williams & James, Pontypridd 7,859 0 0
Morris & Thomas, Pontypridd 7,011 0 0
L. Evans, Tonyrefail 7,548 19 10
C. H. Cooksley, Pontyclun 7,250 0 0
D. W. Davies, Electric Car Depot, Roath, Cardiff 6,403 13 10
* Accepted.

RUNCORN.—For the construction of new sewerage and sewage-disposal works at Helsby, for the Runcorn Rural District Council. Mr. W. H. Radford, engineer, Albion Chambers, Nottingham:—
H. Dale, Northwich £11,657 10 0
R. Lomax, Lostock Hall 11,270 19 0
J. Taylor, Garston 11,000 0 0
J. A. Ewart, Warrington 9,448 0 0
J. H. Vickers, Nottingham 9,120 18 0
Bower Bros., Halifax 8,905 0 0
J. E. Dean, London 8,742 1 6
W. Cottle, Stockport 8,057 16 0
H. E. Buckley, Bingley, Yorks 8,035 1 8
* Accepted.

SURBITON.—For storm-water drainage for the north side of the railway, for the Urban District Council. Mr. Samuel Mather, A.M.I.C.E., engineer and surveyor:—
T. Free & Sons, Maidenhead £12,160 0 0
G. Rutter, Barry, South Wales 9,375 0 0

J. A. Dunmore, Crouch Hall Road, London 9,101 0 0
C. W. Killingback & Co., Camden Town 8,107 0 0
J. Dickson, St. Albans 7,664 0 0
Case Sea Defence Syndicate, Holborn 7,280 18 0
E. Parry & Co., Fulham 7,175 0 0
G. Bell, Tottenham 7,071 12 10
Streeters & Todhunter, Godalming 6,998 0 0
S. Kavanagh & Co., Surbiton 6,890 4 7
J. & T. Binns, Croydon 6,858 0 0
* Accepted. [Surveyor's estimate, £7,261 11s. 8d.]

SHREWSBURY.—For the erection of a residence, "Kingsland," for Mr. Samuel Jackson (exclusive of plumber and painter). Mr. G. Dickens-Lewis, architect, Talbot Chambers, Shrewsbury. Quantities by the architect:—
W. Bowdler & Sons 1,390
Henry Price 1,244
John Gethin & Co. 1,333
R. Price & Sons 1,246
E. H. Nicholas 1,313
Gen. H. Bickerton 1,242
T. Pace 1,288
* Accepted.
[All of Shrewsbury.] (Architect's estimate, £1,300)

THISTLETON (RUTLAND).—For the execution of farm buildings and cottages at Thistleton, Rutland, for Sir A. J. Fludyer, Bart. Mr. J. B. Corby, F.S.I., architect, Stamford:—
J. Woolston, Stamford £1,745 0
S. F. Halliday, Stamford 1,563 10
Roberts Bros., Stamford 1,528 0
J. Perkins, Easton 1,420 0
Nichols Bros., Oakham 1,340 0
Chappell & Sons, Bourne 1,218 0
Emerson & Co., Cottesmore 1,204 0
* Accepted.

COMING EVENTS.

Wednesday, July 30.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion to Trinity House, Quayside, Newcastle, 6 to 9 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting in the Rooms of the Literary and Philosophical Society, Newcastle-on-Tyne (Second Day), 10 a.m.

Saturday, August 2.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS (Newcastle-upon-Tyne).—Annual Meeting at 2 p.m. Council Meeting at 1.30 p.m.

Wednesday, August 6.

SANITARY INSPECTORS' ASSOCIATION.—Autumn and Provincial Meeting and Conference at Middlesbrough (First Day). Council Meeting in Committee Room, Municipal Buildings, at 6 p.m.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at

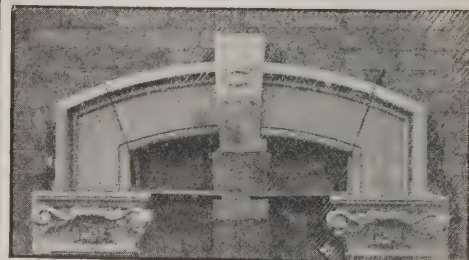
Middlesbrough (Second Day). Reception by the President and the Mayor of Middlesbrough at 10 p.m. Presidential Address by Sir James Orichton-Browne, M.D., LL.D., F.R.S., at 10.30 a.m. Extraordinary General Meeting at 11 a.m. Mr. T. Pridgen Teale, M.A., F.R.S., on "A Short Sanitary Retrospect." Visit to Saltbourn at 2.30 p.m.

Friday, August 8.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at Middlesbrough (Third Day). Sir James Orichton-Browne on "Malaria: Its Practical Bearing on Sanitation." Mr. George H. Anderson on "A Quarter of a Century's Sanitary Progress in Middlesbrough." Dr. J. Wright Mason, M.O.H., on "Port Sanitary Administration." Dr. Dingle M.O.H., on "Infectious Diseases," 10 a.m. Garden Party in Albert Park at 2 p.m. Banquet in Town Hall at 6.30 p.m.

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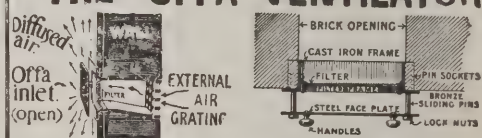
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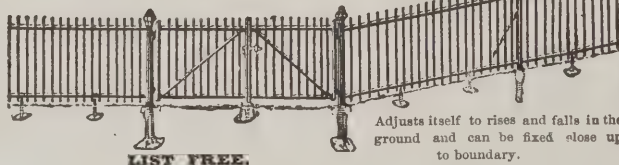
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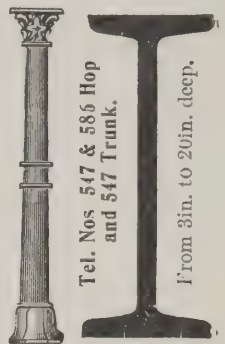
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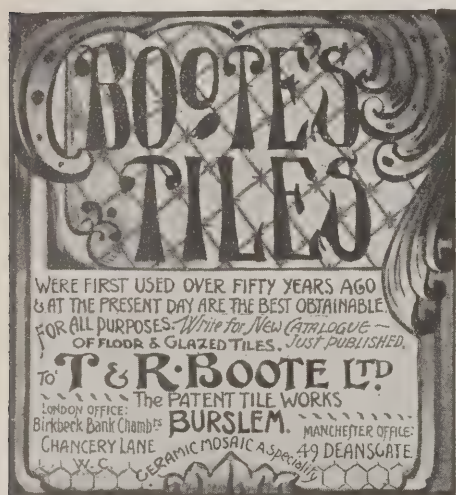
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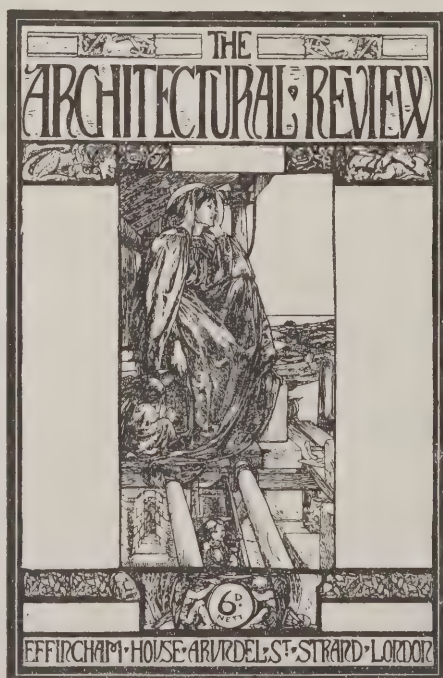
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A Note on the Loggetta.

THERE seems to be a very indefinite idea prevalent as to the loggetta which was crushed

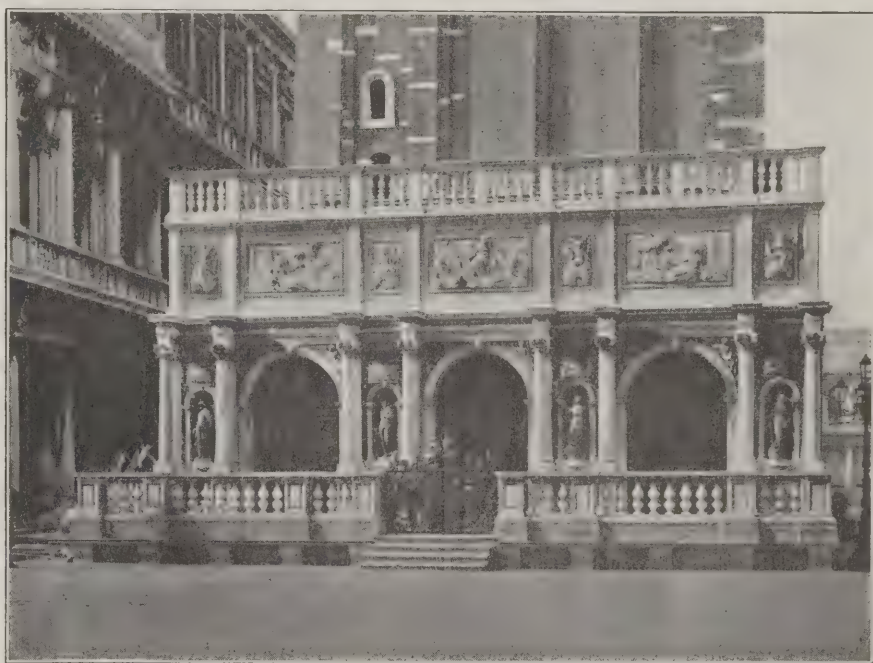
by the fall of St. Mark's Campanile, and it will therefore be of interest to explain exactly where and what it was. The accompanying illustration shows the loggetta. Many persons supposed that it formed part of the library which was so severely damaged (shown on the left of the illustration and also on p. 359 of our issue for July 23rd), whereas the loggetta was a small building about 25ft. high attached to the campanile itself on its eastern side. Among other purposes it was used in former days as a waiting hall for nobles attending the palace, and was notable for the beautiful bronzestatues and reliefs on its front and the celebrated bronze gates—all the work of Jacopo Sansovino, who designed the adjoining library (this, it will be remembered, was the model for the Carlton Club, Pall Mall). It will always be a wonder that so little damage was done by the fall of the campanile, but this loggetta at least was utterly annihilated, though one or two of the panels and the gates have been recovered. In our opinion, however, there has been a great deal of unwarrantable eulogy given to these gates, for their design is very involved; and we venture to think that if they had been produced at the present day there would have been no lack of hostile criticism. But the four bronze figures that occupied the niches on the front of the loggetta were indeed charming specimens of design and execution. Sansovino was eminently a sculptor, the pupil of the celebrated Florentine sculptor, Andrea Sansovino, in compliment to whom he changed his own name, which was Fatti. He devoted himself to the study of antique sculpture in Rome, and when that city was sacked in 1527 he went to Venice and there executed a number of buildings and figures. He did good service to St. Mark's by strengthening the domes with bands of iron, but it is interesting to note that his professional reputation was once in great jeopardy, for scarcely was the vaulted ceiling of the library completed than it fell down; for which he suffered imprisonment and a fine, though he was eventually set free and restored to his post through the intervention of friends. An inconsistency of the campanile loggetta was that, whereas the front bore the statues of heathen deities, there was within a figure of the Virgin Mary; while, in Sansovino's bronze door to the sacristy of St. Mark's the two principal compartments represent the Saviour's death and resurrection, and the smaller panels are decorated with the heads of the Evangelists and some of the sculptor's own friends—a common incongruity of those days.

A very quaint and interesting description of the loggetta was given in last Friday's literary supplement to the "Times," in the course of a letter by Mr. Sidney Colvin. At the beginning of the seventeenth century Thomas Coryat spent six weeks at Venice and afterwards published his "Crudites" describing the city. Mr. Colvin quotes his characteristic description of the campanile—"which is a very faire building made all of bricke till towards the toppe"—but we wish now to give Coryat's account of the loggetta itself:—"There is adioyned vnto this tower a most glorious little roome that is very worthy to be spoken of, namely, the Logetto, which is a place where some of the Procurators of Saint Markes doe vse to sit in iudgment, and discusse matters of controuersies. This place is indeed but little, yet of that singular and incomparable beauty, being made all of Corinthian worke, that I neuer saw the like before for the quantity thereof. The front of it looking towards the Dukes Palace is garnished with eight curious pillars *versicoloris marmoris*, that is, of marble that hath sundry colours; whereof foure are placed at one side of the dore, and foure at another. The steppes of the staires, which

Ironwork in Streets.

In our modern streets there is one feature capable both of use and beauty which is strangely

absent; this is ironwork. On the Continent it figures largely in balconies, especially in Paris, where it attracts the observation of every traveller; and not in balconies alone, but in gates and railings, in lamp standards and ornamental openwork over glass panels it is everywhere in evidence, always treated in conjunction with surrounding objects and proper subordination to design. In London it is palpable that the subject has received very little attention, though during the last few years there has been some revival of ironwork as a useful and decorative feature, and it is to be hoped that it will be permanent. Light flowing designs, suggesting the idea of extreme strength with extreme lightness, best fulfil the popular conception of ornamental ironwork, and in a general way it is right. But cast iron can be effective too, if well treated. The fine railings around St. Paul's are excellent, though very simple; they came from the old works on the Sussex border when wood was used instead of coal for smelting and the neighbourhood of Tunbridge Wells was the



THE SANSOVINO LOGGETTA TO ST. MARK'S CAMPANILE VENICE, NOW DESTROYED.

are in number foure, are made of red marble. Two faire benches without it of red marble. The walke a little without paned with Diamond pauier contrined partly with free stone, and partly with red marble, all the front of red marble, except the images, which are made of most pure alabaster: ouer the tribunal where the Procurators sit, the image of the Virgin Mary is placed bearing Christ in her armes made of alabaster, and two pretty pillars of changeable-coloured marble on both sides of her, vnder whom this is written in a little white stone, *Opus Iacobi Sansouini*. The sides of the dore are made of alabaster, and the top rayled with a curious tarrasse of alabaster. On both sides of the dore are foure very goodly faire statues made in brasse, two on one side, and two on the other. Each betwixt a paire of those curious pillars that I haue spoken of; on the right hand as you enter the dore there are these two, the statue of Mercury with a dead mans skull under his feete: the other the statue of Peace with a burning torch in her hand, wherewith she burneth an helmet (a strange thing to burne steele with fire) and a Target. On the left hand these two; Pallas very exquisitely made with an helmet and a feather in the crest, a shield in one hand, and a trunchin in another, a mantle about her and a Souldiers coat of maile; the other the statue of Apollo like a stripling without a beard, with an horne in one hand, and a quiner full of arrowes in another hanging down about his necke. All these statues were made by *Iacobus Sansouinus*, a Florentine."

"Black Country." Thence too came many of the weapons of the time, notably the guns with which Marlborough conquered at Blenheim and Ramillies. Of modern cast-iron, the grille surrounding the station yard of Charing Cross Terminus is not without merit. The ironwork also through which we approach the Houses of Parliament is fairly effective, but it was an afterthought; the architect's design was that the Palace should be completed by building two more sides to Palace Yard in the same ornate Tudor style as the others, when of course no railings would have been needed. But on the whole there is but little noticeable ironwork in London. The revival of hanging signs is satisfactory, and some of these are handsome, though occasionally marred by being too large and heavy; flowing ironwork is beginning to be placed over glass in doorways, and does something to mitigate the visual discomfort of too much glass-surface, and even iron balconies are making their appearance, though not as a rule of very striking design. In the suburbs a system has arisen of apparent balconies, often tasteful so far as the ironwork is concerned, but into which it is impossible to enter; in other cases, especially in flats, a very narrow balcony with iron balustrade is entered from the side. Ironwork is also used rather sparingly over or in conjunction with small garden walls; but of stately iron gates, once so characteristic of English decorative industry, there is lack. Of "flamboyant" cast-iron work the most pronounced is that which prances over the London Hippodrome.

THE WOLVERHAMPTON EXHIBITION.

THE Art and Industrial Exhibition now being held at Wolverhampton is disappointing. It was to be expected that Wolverhampton, being the centre of a large manufacturing district, would have done things on a larger scale. Of course the exhibition is not an international one, and must not therefore be compared with Glasgow, though we cannot help doing so in regard to some matters. Now it is apparent that in holding such an exhibition at Wolverhampton there were two alternatives. First the exhibition had to deal with manufactures of the district, and it was open to the promoters to have gathered the exhibits together in simple pavilions. If thoroughly representative in this respect, the exhibition would have afforded the requisite advertisement, and considerable profit would have accrued to Wolverhampton and its district, and also to firms that had goods to sell there; and the promoters would have been able to remunerate themselves for the outlay by the prices paid for the stands, as is done at the small trade exhibitions usually held. Of course support would have needed to be guaranteed first from the manufacturers. The promoters of the present exhibition, however, wishing to make a greater show, and to emulate the example of Glasgow and other international exhibitions, sought to get increased custom by providing a place of public amusement, trusting that there would be a few more customers among the many more members of the general public and that the popular support would provide another source of considerable profit which would help to pay off the debt on the Free Library and aid the Technical School. But to secure popular support it is apparent that an exhibition must have a festive character, with abundance of attractions—side-shows, bands, &c. There cannot be any half measures in this matter; but the additional cost requisite to catch the public is generally so large that if the attractions are less than required a considerable loss will probably result. In our opinion this is where the Wolverhampton Exhibition has failed as an immediate monetary success. It has also failed to represent the manufacturers of the Black Country. The Machinery Hall, which one would expect to be the largest and most important of all the buildings; is smaller than the Industrial Hall, which itself is not large, and the exhibits are very second-rate, little large machinery being shown and few local firms represented.

The site of the exhibition consists of a portion of the West Park (which was granted by the Corporation) and of land lent by Lord Barnard adjoining Newhampton Road. Former exhibitions were held in 1839, 1869 and 1884, not however on the present site, which is that of the old racecourse. One would have thought that the experience of these exhibitions would have led to the better realisation of the present one.

Messrs. Walker & Ramsay, of Glasgow, the architects, have performed their part of the work well, considering the small amount of money placed at their disposal. Their task was, firstly, to efficiently house the exhibits, and secondly to make the buildings as light and festive as possible. It is, however, impossible to refrain from comparing them with Mr. James Miller's buildings at the Glasgow Exhibition last year. In this comparison the Wolverhampton buildings must suffer. The Glasgow people are just as hard-headed men of business as those at Wolverhampton, and know how to make things pay; they realised what the Wolverhampton manufacturers apparently with their cheese-paring methods do not—that to make money some must first be laid out. At Glasgow Mr. Miller was able to give his buildings interest by varied and plentiful detail, although his exceptional talent in performing a large amount of work so excellently in a short period of time must not be forgotten as a great factor in the success achieved. Messrs. Walker & Ramsay carried out the Canadian Pavilion at the Glasgow Exhibition, and they have modelled their work at Wolverhampton on the lines of Glasgow. With this strong reminiscence of the northern exhibition unfavourable comparison is sure to be made, but, as we have said, the failure is not so much with the architects as with the conditions.

It will be seen from the views we publish how slick and bare the buildings appear, with the mechanically-repeated detail (variation in this would have added to the expense), but nevertheless they give plenty of brightness and supply most of the interest the exhibition possesses. This is a hard test, and that they should have come out of it so well says much for the ability of the architects to deal with such contrary conditions. The laying-out of the grounds was also superintended by them with considerable success.

It was not until the end of September last that the erection of the first building was commenced, and by the end of April Messrs. Walker & Ramsay's work was complete. It will be seen therefore they have had no light task. They were materially assisted by Mr. John

Herd, the clerk of the works, who held a similar appointment at the Glasgow Exhibition last year. Elaborate and fanciful effects are to be expected of exhibition architecture, which is of the nature of stage scenery. One effect of the comparative plainness of the Wolverhampton buildings is that they appear more like real buildings and unconsciously invite comparison. The design of the Canadian Pavilion is especially noticeable in this respect; it has little of the nature of temporary work, and makes little appeal to the pictorial or graphic sense. Its dummy columns, cornices and dome strike one as mere paltry shams, having nothing to carry them off and make them logical elements in a graphic design. The Industrial Hall is better as an example of picturesque design for temporary purposes.

The lay-out of the exhibition will be seen from the general view (taken from the top of the water-chute) illustrated on the opposite page, and the site plan. The Industrial Hall, Canadian Pavilion, Strathbarn Restaurant and Machinery Hall, it will be seen, form a crescent facing the main avenue, and command a view of the full extent of the park. To the north-east of the Industrial Hall, and abutting on Lansdowne Road, is the Connaught Restaurant, with shell bandstand combined (illustrated on p. 399), and to the north of this is the Newhampton Tea-room. Close to the Machinery Hall is the water-chute. On the south side of the main avenue, slightly to the centre of the east of the crescent, is a side-show, a "Voyage through Fairyland," and still further south is the "Spiral Toboggan." Again, to the east of this is the Concert Hall and the "Hall of Mirrors" (another side-show forms a connecting link between it and the Connaught Restaurant). In the centre of the irregular plot on which the side-shows are situated is a bandstand erected by Messrs. McDowall, Stevens & Co. Grouped around the main buildings are smaller pavilions for the accommodation of Colonial exhibits, and a number of private pavilions and kiosks.

The Industrial Hall, which forms the north-eastern termination of the crescent, measures 350ft. by 12ft. The main façade is an open arcade which is utilised as a tea terrace. The central feature of this façade is the main entrance, well proportioned in its mass, though the heavy hood moulding terminates somewhat awkwardly at the sides. The horseshoe-shaped opening adopted for the entrances is a perfectly legitimate form in a construction of this character, and by the adoption of such forms the nature of the material is expressed. The lines, however, must be harmonious with the surroundings. The design of the stencil used in the central entrance is not so good as that employed for the end entrances. The semicircular windows in the latter give the additional light which is needed to counteract the loss of light from the range of top lights not being continued on the end cross-roofs. The ends of this building, it will be noticed, are not so strongly emphasized as the centre, the low octagonal corners not being domed, like those at the side of the central entrance. The whole building is left white except for the entrances, which are coloured in a dull light blue tint with orange-coloured stencil decoration. The roof is slate-coloured and the doors in the entrance are painted emerald green.

The two main towers are 120ft. high and are capped by open lanterns. Mr. Miller has given it as his opinion that it is useless troubling about detail until the general mass is right, as no amount of good detail will correct a bad skyline or mass. It would have been well if Messrs. Walker & Ramsay had given a little more consideration to this point, for the masses of both the Industrial Hall and the Machinery Hall are weak. In the former the towers look especially feeble. This building is long and low, and to secure emphasis of the vertical considerable mass was needed. At Glasgow this was got by a large dome skillfully led up to, but at Wolverhampton recourse has been had to towers. The proportions of these are unfortunate; the projection of the balconies has undoubtedly given them strength, but it has caused them to look attenuated below, a defect increased by strong modelling at the top, just beneath the balcony. The semicircular recesses are not openings, as might be thought from the illustration on p. 400, but are filled up and



THE WOLVERHAMPTON EXHIBITION: GROUND PLAN.

- 1, Boiler-house. 2, Machinery Hall. 3, Restaurant. 4, Canadian Pavilion. 5, Industrial Hall.
- 6, Restaurant. 7, Press-room. 8, Shell Bandstand and Restaurant. 9, Magic Mirrors.
- 10, Concert Hall. 11, Bandstand. 12, Spiral Toboggan. 13, Rivers of the World.
- 14, Water-Chute. 15, Restaurant. 16, Restaurant.

coloured red. This colour is too strong; instead of weakening the modelling at this point, as was needed, it has increased the strength. Then, again, the lanterns with their wide eaves are elevated just a little too much to secure the needed relation with the balconies below. To keep these at their present height, the columns should have been more massive, and the cylindrical form led up to from the cubical one below. We may remark, while on the subject of these towers, that their domical tops have been covered with a shiny yellowish olive-green canvas, which is not nearly so effective in giving the effect of gold as if the domes had been treated like those at Glasgow. The two small domes by the side of the principal entrance have been silvered and look well. The end elevations are treated similarly to the main façade, the towers at the entrances being, however, only 90ft. high. The hall is divided internally into three bays, laminated circular roof-trusses being used to carry the roof, similar to those used at the Glasgow Exhibition. The long low effect of the

think it would have been better to have emphasized the circular outline, using this form to determine the character of the design. The building is not expressive of its purpose. As we said, it should have been the chief building in the exhibition. The principal entrance is given that peculiar form that we are familiar with in German and Austrian work of the "Art Nouveau" school. The figure over the doorway represents Industry. Internally, the building is divided into three bays, the centre one being 60ft. wide, and the side bays each 38ft. wide. The roof is constructed on the bow-string principle with wooden lattice trusses.

The Concert Hall is 143ft. by 72ft., and is rectangular on plan. It has a tower at each end. The floor is raised so as to enable every person in the audience to see well, and the platform is arranged on one of the long sides of the hall so that the projecting portion may be removed in order to permit gymnastic displays. A corridor runs round three sides of the building in which are arranged exhibits of drawings and examples

descent lamps at night is pretty, and gives many suggestions for colour treatment of the buildings. These lamps are in various colours, mostly arranged on the same principle as the colouring of the buildings, namely, red lamps are used around parts that are coloured red, and green around the entrances, which are themselves greenish in tone. The light diffuses, however, over a greater expanse than just the parts covered by colour and shows how the colouring might be extended with advantage.

The buildings—Industrial Hall, Machinery Hall and Concert Hall—cover a space of 127,215 sq. ft., and other buildings in the grounds cover an area of 20,980 sq. ft., exclusive of the 8,000 sq. ft. covered by the Canadian Pavilion. The cost of erecting the buildings has been nearly £50,000, and the other expenditure is expected to bring the total up to £100,000.

The Art Exhibition is not in the exhibition grounds, but at the Municipal Art Gallery. This exhibition is not a large one, but excellent of its kind, containing a section devoted to



GENERAL VIEW OF THE EXHIBITION.

[Photo: Whitlock & Sons.

ridge has been marred externally by wooden curved ornaments. In addition to the three bays into which the hall is divided there is a half-bay added at the rear, while the corresponding half-bay at the front forms the tea-terrace above referred to. Internally, over the entrance in the east elevation is a Musicians' Gallery, which can be used for band performances in wet weather. This is an innovation in buildings of this character, and is a distinct advantage.

The Machinery Hall is 350ft. by 130ft., and its main front faces the south-west elevation of the Industrial Hall and the Canadian Pavilion. The outline of this front is semicircular, with a strong emphasizing of the verticals in the shape of two small central towers and two end ones. These latter look bold and give good abutment to the curve of the front, but their junction with the domes is not well managed. The two centre towers are weak and the semicircular fan-like ornament in the centre is very crude—and its effect when lit up by electric light at night does not compensate for its adoption. Altogether we

of woodwork, needlework, &c., by children in the principal schools of Wolverhampton. The roof is coloured red.

The Canadian Pavilion, which in many respects contains the best collective exhibit, has a colonnade front, surmounted by a dome, and has been erected at the expense of the Dominion Government. It covers 8,000ft.

The Connought Restaurant is two storeys high and accommodates 1,600 persons at table. It contains a special room for the reception of distinguished visitors. The feature of the front is the Shell Bandstand, which, though not truly elliptically curved, has good acoustical qualities. The roof of this building is coloured red.

The painting and decorating of the Machinery Hall, Canadian Pavilion and Refreshment Room were entrusted to Mr. George Greenstone. It is a pity that such opportunities for experiment in the direction of structural colour decoration as these temporary exhibitions afford should not be made of greater use. The scene when the buildings are lighted up by the 20,000 incan-

Japanese art, and examples of the work of our leading living artists, as well as of the Pre-Raphaelite brotherhood, and a few examples of leading foreign painters. Especially noticeable are Whistler's portrait of Carlyle, with a goodly number of etchings by the same master, etchings and drawings by Professor Legros, and paintings and drawings by William Strang, Rodin, Alfred Stevens, W. Rothenstein, Shannon, Ricketts, G. F. Watts and Burne-Jones, Ford Madox Brown's "Last of England," Millais's "John Ruskin," Holman Hunt's "Two Gentlemen of Verona," and the late John Brett's "Val d'Aosta."

The Exhibits.

There is very little that calls for special note among the exhibits. There is a large section devoted to Japanese art manufactures in the Industrial Hall, established by the Japanese Government, and a noticeable stand is that of Denmark, which shows a large number of examples of beautiful porcelain from the Royal



WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION: THE MACHINERY HALL.
WALKER AND RAMSAY, ARCHITECTS.

[Photo: Whitlock & Sons.]

Danish Porcelain Works, Messrs. Chubb & Sons of London and Wolverhampton, have a large exhibit of locks, safes and strong rooms. Mr. George Faulkner Armitage, of Stamford, Altrincham, and 18, Clifford Street, London, exhibits an entrance hall in panelled oak with fireplace in recess, under a gallery approached by winding stairs; the furnishing and decoration of this is neat and pleasing. The Cannon Iron Foundries, Ltd., of Bilston; the Carron Co., and Messrs. Ward Brothers, of Wolverhampton, show a large selection of ranges, builders' ironmongery, &c. Messrs. George Howson & Sons, Ltd., of Hanley, have a stand exhibiting their sanitary appliances, such as baths, water-closets, lavatory basins, &c. Messrs. Mander Brothers, of Wolverhampton, have perhaps the most striking stand in the Industrial Hall in the shape of a small pavilion in Moorish style, painted with colours of their manufacture. The Wolverhampton School of Art has a stand in the hall designed by one of the architectural students, Mr. G. H. T. Robinson, the outer walls of which are decorated with paintings by Mr. J. E. Wootton representing branches of industry carried on in the school.

In the Machinery Hall the Farnley Iron Co., Ltd., show their iron and fireclay goods. The glazed bricks are true in shape, and the excellent colours disprove the contention of some manufacturers that leadless glazes do not give good results. Messrs. J. Sagar & Co., Ltd., of Halifax, have a large exhibit of woodworking machinery.

In the Canadian Pavilion there is an extensive collection of specimens of the timbers of Canada, which should prove of considerable service to persons connected with the building industry.

Mr. C. N. Barkin, of Wolverhampton, has erected a special building next to the Machinery Hall with Mack patent slabs and vulcanite roofing, for which goods he is the local agent. The entrance gates have been executed by Messrs. Bayliss, Jones & Bayliss, Ltd., of London and Wolverhampton.

The photographs illustrating this article are by Messrs. H. J. Whitlock & Sons, Ltd., the official photographers to the exhibition.

Four New Halls in the Louvre Museum have been arranged by M. Georges Bénédict, the eminent Egyptologist

THREE WARWICKSHIRE CHURCHES.

THE Birmingham Archaeological Society recently visited three of the most interesting churches in Warwickshire—Knowle, Temple Balsall and Berkswell. The fine church at Knowle may be described as a study in church extension. Originally designed as an ordinary parish church, the foundation of a chantry caused the addition of a side chapel, which has now become a transept. The church was afterwards made collegiate, with the result that the chancel had to be much lengthened. The original elevation of the chancel must have been much greater than at present, since the sedilia and piscina, which remain, are at an impossible height above the present pavement. Perhaps the greatest ornament of the church is the beautiful rood screen, though this, like the church itself, has suffered materially from restoration.

The visitors next drove to Temple Balsall. This very beautiful thirteenth-century church derives its name from the Knights Templars, who built it, though they did not long retain possession. It is remarkable for its simplicity, consisting as it does of one single finely-proportioned space, without any division whatever. Being built on rapidly rising ground the body of the church ascends to the chancel by a series of progressive elevations. The geometrical windows are among the best of their kind known, and the whole edifice is surmounted on the outside by very singular representations of human and grotesque heads, full of character. Beside the church stands what was once the grange, with perhaps the refectory of the order. Outwardly this is so changed that no one would date it earlier than the eighteenth century, but within it retains some fine evidence of the actual antiquity. The almshouses also adjoin the church.

A drive by country by-roads brought the party to Berkswell, where the fine church was carefully inspected. This is of various ages, from the twelfth to the seventeenth century, and has the advantage of having been restored with care and reverence. The Norman windows in the east end and the curious and grotesque corbel heads on the south side are striking features. There is also a Norman crypt. Some of the old galleries remain. The vestry over the porch is delightfully quaint.

LEICESTER INFIRMARY EXTENSION.

A NEW surgical wing has been added to the Leicester Infirmary, from designs by Messrs. Everard & Pick, at a cost of about £12,000. The building, which is the first portion of a complete scheme for remodelling the infirmary, comprises two operation theatres, anæsthetic room, nurses' sterilizing and work room, store room, sitting- and bed-rooms for the house surgeon and house physician, bathroom, lavatories, &c., on the first floor. A room for the honorary medical staff, dressers' sitting-room, assistant house surgeon's sitting-room, matron's office, clerk's office, a ward for emergency cases, the hall, the porch, porter's room, and a complete set of rooms for casualty, surgical and emergency cases, consisting of a waiting hall, dispensary, surgery, nurses' room, and two examining rooms, together with sanitary arrangements, on the ground floor. The basement will be set apart for dispensary stores, laboratory, and heating and ventilation purposes. The new casualty rooms are one storey high. All the floors to the surgery and dispensary department, also to the hall, corridors, nurses' and operation theatres, are either of mosaic or marble terrazzo, the whole of the other floors being finished with teak boarding. The walls of the surgery, waiting hall, nurses' rooms, anæsthetic room and corridors adjoining the theatres are tiled, all angles, external and internal, being rounded in order to facilitate cleaning. The whole of the remaining walls, excepting those to the theatres, are finished with Parian cement. The operation theatre walls are faced 7ft high with white veined statuary marble, having a dove-coloured marble border at the top and bottom. With the exception of perfectly plain smooth oak doors, the operation theatres are entirely free from woodwork. Heating is partly by steam and partly by hot-water ventilating coils. The operation theatres, nurses' sterilizing and work room, anæsthetic room and emergency ward are all heated and ventilated by the "plenum" system. In the theatres the incoming air will be distributed by a circular metal spreader, in order to prevent the possibility of draughts. The drainage is entirely of heavy cast-iron pipes, the joints being caulked with lead. Messrs. H. Herbert & Sons were the general contractors for the work, and Mr. William Smith acted as clerk of works.

THE NEW GOVERNMENT BUILDINGS.

Discussion in the House of Commons.

IN the House of Commons on July 29th Lord Balcarras said he wished to direct attention to the public buildings now being erected by the Office of Works—namely, the extension of the South Kensington Museum, the new War Office, and the Local Government Board offices at the bottom of Whitehall. By a curious fatality both the architects appointed in connection with the two latter buildings died within a short period of one another. It had been said that the general drawings for these buildings were practically complete, but that was entirely inaccurate. They were essentially incomplete. There were no full-size drawings whatever, except for two small portions of the joiners' work, which were done in order to allow the surveyor's quantities to be taken out. The real defence of Mr. Akers-Douglas was that there was no architect available to take over this work. It was well-known that architects were not anxious to undertake work for the Office of Works. They were apt to be harassed a good deal. The semi-official letter in "The Times" referred to confidential enquiry after an architect. There ought not to be confidential enquiry when an architect was wanted to carry out probably one of the most important public buildings in London. The great architectural institutions should be consulted. A gentleman was appointed who was on the staff of the Office of Works, and they also appointed one of the late Mr. Brydon's draughtsmen, with the result that there were great public protests and very hostile articles in the newspapers. Responsibility was divided between two men whose views on architectural development might differ *toto caelo*. He asked for some assurance that Mr. Brydon's designs should not be interfered with by the Office of Works. Would the archway connecting the new buildings with the old be maintained? Would Mr. Akers-Douglas maintain the towers? What steps would be taken as to the extension of the buildings? He wished to know if the finished drawings would be made from Mr. Brydon's sketches, and, if so, he hoped the Office of Works would employ a skilled and efficient architect, not simply an experienced surveyor who had distinguished himself by erecting police-stations and post-offices all over the kingdom. If a skilled and appreciative architect were not employed the inherent beauty of Mr. Brydon's designs would be vulgarized and destroyed. Within the next few years there would be much work to be done upon our public buildings in London, and it was to be regretted that his right hon. friend had not appointed some man of architectural experience to supply the technical knowledge which could not be expected in the departmental Minister.

Mr. Akers-Douglas said that when it was decided to erect the new public buildings the Go-

vernment thought it better, having regard to the unfortunate results of public competition, to select an architect. At the request of the Government the Council of the Royal Institute of British Architects named a panel of architects qualified for the work, and from that panel Mr. Young and Mr. Brydon were chosen to prepare plans for the new War Office and the new Local Government Board Office respectively. As to the buildings at South Kensington, plans were prepared some years ago by Mr. Webb, and as that gentleman was still prepared to carry them out the Government thought it best to leave the work to one who had on so many occasions shown great talent. But with regard to the other new buildings it was thought desirable to associate with the architects selected Sir John Taylor, whose long service to the State afforded him such an intimate knowledge of the requirements of public offices. Too often in the past the architect of public buildings had thought only of his elevation and not sufficiently of his interior. The rooms on the top floor of the Foreign Office were a case in point. To suit the elevation the windows were close to the floor, with the worst results on the lighting and the ventilation of the rooms.

Lord Balcarras: That is because the Office of Works interfered so much with the architect.

Mr. Akers-Douglas said that his noble friend disliked so intensely the Office of Works that nothing would convince him on the point. The plans for the new buildings were submitted to the House of Commons and approved, and orders were given to proceed with the work. But the plans had only been completed in one case when Mr. Young died; and Mr. Young's son was then appointed to carry out his father's plans, in association with Sir John Taylor. In 1901 Mr. Brydon also died, leaving no one to succeed him. The plans, which had been approved, and on which large sums had been expended, could not be abandoned, and the Government were anxious to have them carried out in their integrity. He had tried to get an architect of note to undertake the work, but it was only possible on condition that the architect was given a free hand. They had the assistance

of Sir John Taylor, who had worked constantly both with Mr. Young and Mr. Brydon in the preparation of these plans, and was intimately acquainted with Mr. Brydon's desires and in sympathy with his views. They also engaged Mr. Brydon's chief assistant, who had under that gentleman's personal direction prepared the greater portion of the drawings, to carry out the smaller drawings and the necessary details. He could assure the noble lord that the saving of expense was not his main object at all, and that he was perfectly ready to spend all the money if he thought good work could be done with it. In order to secure to the House that the plans which they had approved of should be carried out in their integrity and without any change, directly he received them from Mr. Brydon's executors he had them stamped and countersigned by the president of the Royal Institute of British Architects; and, if the House desired it, the plans would be deposited there and would be entirely at their disposal.

The noble lord had asked him for an assurance that no variation whatever should be made in these plans. He had already given a public assurance, and he now repeated it, that no variation at all would be permitted in the external elevations, and that, where it was necessary to make slight variations in smaller matters, such as knocking two rooms into one, they should only take place when approved by the president of the Royal Institute of British Architects and the consultative committee.

The noble lord had rather suggested that he had not brought quite so much attention to the affairs of his office, or especially to the matter of these buildings, as he might have done, owing to the fact that he last year presided over the committee on the education of officers in the Army. He would point out that this was the first time that he had heard in that House the acceptance of a very unpleasant and onerous duty of that sort thrown in a Minister's teeth.

The Queen Victoria Memorial.

With regard to the Queen Victoria Memorial, he pointed out that it was not a work which had been undertaken by the Government. The King appointed a committee to consider the question of this memorial, and the committee, after having decided on the general form of the memorial, appointed an executive committee, to whom they referred the question of site and design. This committee reported in favour of the designs of Mr. Brock and Mr. Aston Webb, with whom the general committee authorized arrangements to be made. Mr. Brock's model had already been completed, and he understood that Mr. Webb's would also shortly be finished. It was His Majesty's desire that these models should be submitted to the public as well as to the committee. The monument would only take up a small portion of the space in front of Buckingham Palace, and would lead to very slight curtailment of the park.

Replying to further questions, Mr. Akers-Douglas said that the committee on the ventilation and sanitation of the House would not be able to finish their labours before the autumn session, but they would present an interim report. With regard to the new Admiralty buildings, the north and west blocks were now finished, but there had been great difficulties with the foundations of the south block; these, however, had been overcome, and the buildings were now proceeding rapidly. They were fortunate enough to find a bed of gravel on the site of the new War Office; they were more fortunate in the matter of foundations in Parliament Street than they expected. As to the opening of the Mall, the Office of Works were perfectly ready to proceed as soon as the money for the purpose could be found. He had hoped to introduce a Bill to enable him to transfer to that purpose certain moneys which had been marked down for public improvements in London. No doubt in the autumn he would be able to do so.

Professor Lanteri has practically completed his bust of the King, for which His Majesty gave him sittings. It is destined for the French Hospital in London. Professor Lanteri's textbook on "Modelling" will shortly be followed by other volumes on low relief, sculptured ornament, medals and other higher applications of the art.



METALWORK ON THE FRONT OF THE MACHINERY HALL
BY MESSRS. BAYLISS, JONES & BAYLISS, LTD.

CIVIC ART AS EVOLUTION, NOT REVOLUTION.*

By CHARLES MULFORD ROBINSON.

I WISH to suggest for your consideration civic art as the latest step in the course of civic evolution, that the flowering of great cities into beauty is the sure and ultimate phase of a progressive development. Consider how it has represented the crown of each successive civilization. If decadence has followed it; if the beauty of Babylon, the storied splendour of Carthage, if the chaste loveliness of Athens and the magnificence of Rome marked in each case the culmination of an empire, it has been through no effeminacy and weakness inherent in the development itself. Rather has it been because the glory showered upon these cities was a concentrated expression of the highest civilization and the highest culture of which the empire was capable.

All that is best the city draws to itself. As magnets acting on filings of steel, the cities attract from their dependent fields whatever there be of learning, culture and art. The adornment that was lavished upon Venice, Florence and the minor city-republics of Italy, and again upon the Flemish cities, represented not weakness but the virility and rich abundance of those qualities of mind and heart which expressed themselves in the southern and northern Renaissance. Had the cities been less beautiful, the Renaissance had been less notable. They mutually interpret each other; and cities begin to bud and flower in beauty only when learning, culture and art are flowering around them. As long as these grow in might, cities grow in nobility, being concentrated expressions of these forces.

The development will, of course, differ in aspect as the civilizations differ in character. The art of Greece was sculpture, and the glory of Athens in her golden age was the chiselled art of the Acropolis. Rome was imperial, and her glory found expression in construction that was colossal and magnificent. The art, again, of the southern renaissance was painting, and we find in frescoes and in the more delicate, more pictorial, phases of architecture the triumph

of the Italian republics. To-day the spirit of the time is commercial and industrial, and our modern civic art expresses itself in terms that commerce and industry comprehend. That our civic art must differ from that of other times does not mean, therefore, that it is not art, or that the new day for cities will be less brilliant than of old. Rather, if truly the heir of the past, it must be the new glory of a new time.

Commerce and industry now express themselves, in the realm of city æsthetics, in great highways, in commercial palaces, in bridges and wharves and stations. The love of nature, the lately aroused consciousness of what we may call the sentiment for landscape, brings vegetation into the busy city to soften and brighten; and then the spirit of practical philanthropy so evident to-day plants playgrounds, builds schools, and insists that modern civic art shall pervade all quarters of the town, remodelling alleys as well as avenues.

If, in general, civic art be a phase of urban evolution, it should be possible to trace the steps by which it is approached. In the new rise of cities, consider what these have been. There came first the aggregation. Where no city had been the people flocked—the reason need not now concern us—until there was a city. The aggregation continuing, led quickly to congestion—at least in parts of the community—and close upon congestion came squalor. We had now a large city, a crowded city and a miserable one. Out of misery came corruption, debauch of the popular conscience, and, from such favourable conditions, political knavery. These, swiftly, are the steps of the downward course. But all the time there were forces at work for good. The very evil into which affairs had passed created a disgust that vastly aided the reform endeavours. So reform efforts gained gradually in importance.

Ideals were put before the people, and to some extent assimilated. There had already been evidences of æsthetic aspiration, first noted in those quarters in which was congregating wealth—that wealth which had begun to accumulate in accordance with the laws the foreseeing of whose operation had induced the forming of the city. But such is the force of good example that the æsthetic aspirations had spread broadly through the town. Elementary construction, also, had begun. At first this was for the sake of the traffic and of sanitation, but by degrees it had a more distinctly æsthetic purpose. Of

these forward steps, some of course were taken coincidentally with the backward, for the community did not march first one way and then the other. Two forces were pulling in opposite directions, and if political knavery turned constructive efforts in the public works to its own evil purposes, the physical condition of the town in its turn gained something from the official eagerness to rob it and the stupid dormancy of the popular conscience that afforded the opportunity for such outrage in ordinary constructive work. Thus the early improvements were purchased at an immensely extravagant price; but there were improvements, and they were hastened.

With varying celerity the conscience now awakens. The reform efforts enlisted individuals, and then associations of individuals, who were concerned in bettering not alone the government but the aspect of the town. Where officials were distrusted and individuals and associations tried to act by themselves, or where the trust in officials was misplaced, there followed necessarily much waste, extravagance and positive injury by poor taste. As the like result followed either of these choices, we find its expression indeed almost universal. Then came another phase in the civic development. This was perception of the waste, extravagance and lack of artistic judgment, and a willingness to seek their correction by submission to expert guidance. With this came co-operation, eagerness to learn the experience of other places and to profit by it, and dependence on those authorities whose knowledge, genius or talent is broadly recognised. With this new chapter, wherever it is now entered upon, begins modern civic art as distinguished from merely the improvement of cities.

In the broad field of cities examples can readily be found to illustrate the successive steps in this general evolution. The phases will differ slightly here and there as national and local peculiarities stamp the development, but the course is clear, essentially uniform, and leading surely to civic æsthetics as its visible crown. So civic art properly stands for more than beauty in the city. It represents a moral, intellectual and administrative progress as surely as it does the purely physical. It stands for conscientious officials and for public spirit. Where officials are elected by the people it must be an evidence also of an aroused and intelligent populace.

* A paper read before the fourth annual convention of the Architectural League of America.



WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION: THE CONNAUGHT RESTAURANT AND SHELL BANDSTAND.
WALKER AND RAMSAY, ARCHITECTS.

[Photo: Whitlock & Sons.]



WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION: THE CANADIAN PAVILION.
WALKER AND RAMSAY, ARCHITECTS.

[Photo: Whitlock & Sons.]

Perhaps the steps of this civic evolution will stand out more clearly if we turn from abstractions to the concrete.

The census bulletins of the United States show that in that country during the nineteenth century there came into existence 533 communities of 8,000 or more inhabitants each. If we call them all by the name that doubtless four-fifths of them claim, we shall group them as cities, and can say, in the census phrase, that in 1800 the urban population was contained in twelve communities and represented 4 per cent. of the total population, while in 1900 it constituted 545 communities containing more than 33 per cent. of the total population.

This is a group of statistics that illustrates conveniently that nineteenth-century phenomenon which is known as the "urban drift," and which was no more marked in the United States than in other nations—most notably in Germany and England. This, as representing the "aggregation," constitutes what we may call the first step in the civic evolution.

To find some of these communities that are yet in the earlier stages of the subsequent development we may turn with best assurance to the western States. In the newer towns congestion will not, happily, be revealed; but that is a spectacle too familiar in cities of all nations and all times to need illustration, and dreariness has not waited upon congestion. We find the town growing on lines determined partly by accident and partly by the push of enterprising real estate holders, not at all according to artistic design. There is little that can be reasonably called architecture. If a man wants a store, a barn or a house, he goes to the carpenter, and the carpenter puts up the long single-gabled frame structure that is the simplest and cheapest. Possibly, if the owner be a merchant and ambitious to have his emporium impressive, a square front built to the height of the roof peak may be put before the skeleton structure, but this, misleading no one, hardly serves to change the type. If there be no time to build attractive houses, certainly there is none in which to plant gardens. People have not come to live in the place because it is pretty,

but because they want to make money, and they have not learned yet to love the town. It will not even represent "home" to them for several years. Clearly, civic aesthetics are at the antitheses of this phrase; we are yet at the beginning of urban development. In fact, such public spirit as there may be is so crude and sordid that it counts anything—even a water tank—as growth. The moral, intellectual and political conditions in this dreary town need not here concern us. But they cannot be high.

We may pass now to those thriving cities of about 30,000 inhabitants which, met so frequently in the more closely-settled portions of a country, well represent another stage in the development. In the United States they are frankly industrial communities. Political affairs are in that condition when out of the sore need of reform endeavours there is a more or less continuous series of spasmodic reform efforts. But the physical improvement of the town has gone steadily though expensively forward. The town is well lighted, most of the important streets are paved, and there are rather more sewer and water pipes than perhaps are needed; or if the aggregate be not excessive, their location is not of the best, for they have been extended on some streets that may not be built up for a decade at the expense of others that are populated. The industry of the town has begun to roll up the expected private gain. The old type of building has given way again and again to something ornate, garish and showy. Iron is favoured because it can be made to suggest stone, while being cheap. There are stores with cast-iron fronts; there are lawns with red iron deer; there is a soldiers' monument of iron. It is the iron age. The houses are now of all kinds. From the extreme of monotony the town has reacted, seeking the extremes of originality. But the residence streets are lined with trees, the square in front of the court-house is kept in order, and most of the houses stand in little gardens that add much to the attractiveness of the place. The people have begun to love their city. It is their home, and they like to have strangers call it "attractive." There are dis-

tinct yearnings toward better things. Aesthetic ambition has been born.

The next step in the evolution develops rapidly. A park is laid out. If it is done somewhat apologetically with a pushing forward of philanthropic reasons, no one is deceived as to the relative importance of these. Gifts are made to the town. The memorial fountain is really stone, for the iron age has passed; and the new public library is so unmistakably a thing of beauty that although it did not cost as much as the post-office, it is shown to the visitor with no less pride. The new public schools are not barracks within and do not resemble factories on the outside. The factories themselves are improving; and public sentiment has so crystallized that a society has been formed to insist that rubbish be not thrown into the street, that the station grounds be improved, that flowers be generally grown and the waste places taken care of.

This improvement effort is, however, unguided. There is immense scope for the poor taste of untrained individualism. And as the city grows larger and its resources increase, the public works become more spectacular and are striking. The need of artistic guidance both in public and private affairs is more keenly felt; the extravagance and wastefulness of duplicated effort is realised; the value of an authoritative aesthetic control is perceived, and it is appreciated that to make true advance in civic art—which is now frankly a goal—there is needed something more than means and impulse.

Various efforts are made to provide the required artistic supervision. If these are reasonably successful, the city—now rich, self-confident, ambitious for its higher life and its development in beauty—has reached an advanced and healthy phase in its evolution. Without much regard as to what the means are, so long as they are successful, there dawns a period of civic art.

The plan may be to elect as administrative officers of the city persons whose education, refinement and culture, as well as executive ability and business sagacity, are a guarantee that the right things will be done and done well. This has been for the most part the outcome of

the civic reform efforts in Great Britain, and has hastened the dawn among British cities of a civic art based on business principles. In France, under the leadership of Paris, the method has been to summon to the services of the municipality in an advisory capacity the best experts and artists of the city; and the result has been the development of civic aesthetics on thoroughly artistic lines. In the United States where the effort has included the appointment of "art commissions," the banding together of cities and of conscientious city officials in leagues, the association for the public good of artists and architects, and an immense amount of effort by popular improvement societies—with the usurpation by them of critical functions—the tendency, so far as there may be said to be a tendency, is toward federation, co-operation and the exchange of experiences, to the end that there may be evolved so precise a science of city building that henceforth no community need be ugly.

The German theory of city administration is based still more emphatically on scientific principles, almost to the exclusion of other considerations, but it differs from the American in that its dependence is not so much upon a

BRICKS FROM CLINKERS.

Brighton's Proposal.

THE Brighton Corporation have a large scheme on hand for the manufacture of bricks from the clinker coming from the refuse destructor. It is stated that under a German process a complete plant for producing about 12,000 bricks per day of ten hours cost approximately £4,000, and the cost of making 1,000 bricks was about 13s. It is said by this process 3,500 loads of clinker refuse could be manufactured into 1,000,000 bricks at the cost of 13s. per thousand, or a total of £650. If the bricks were sold at an average price of only 28s. per thousand, they would realise the sum of £1,400, a clear profit of £750, in addition to the saving of the cost of carting as at present, 3,500 loads at 3s., equalling £525, or a total of £1,275 per annum. Several English corporations are at the present time considering the advisability of adopting a system of making bricks from the destructor clinkers, but no complete plant has yet been erected in England, although it has been very largely used on the Continent for a long time. With regard

A MASONIC HALL.

A NEW Masonic Hall at Ripon is being erected. The new premises will occupy a prominent position in Water Skellgate, and the plans of Mr. T. Wall, the architect, provide for a two-storey brick building. The main entrance will be in stonework of a Classic design. A staircase hall, 16ft. 6in. long and 9ft. 6in. wide, will be divided from the vestibule by a glazed screen. The hall will be well lighted, and fitted up with lavatory and cloak accommodation, and it will have a mosaic tiled floor. On the first floor, which will be gained by a pitch-pine staircase, there will be an ante-room, provided with a small private door from the Tyler's lobby, effectually shutting off the landing from the lodge-room. The latter room will be 33ft. long by 21ft. wide and 19ft. high, and will have a domed ceiling, rising from an enriched moulded cornice. A natural system of ventilation is to be provided by means of fresh-air inlets and a Boyle's air-pump ventilator on the roof, with proper regulating valves. The floor will be in maple, secret nailed, and at the east end of the room will be a raised dais, having as a back



WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION: THE INDUSTRIAL HALL.
WALKER AND RAMSAY, ARCHITECTS.

[Photo: Whitlock & Sons.]

science as upon scientists. The burgomaster and his magistrates are the best experts procurable, and the council of the latter does not pretend to be citizen-representative, but is made up of honoured, highly-paid, professional and permanent employees trained to the work of city administration. In Germany, therefore, civic art takes on something of the thoroughness and exhaustiveness of German science.

The varying national developments of this late phase of urban evolution are thus interesting mainly as emphasizing the fact that the modern movement toward civic art is international. They reveal, too, that however the exact course of the evolution may vary in different places, municipal aesthetics—the flowering of cities in beauty—is the ultimate, the highest step. It is the phase toward which all the other urban changes tend. It is the goal toward which we are swiftly moving, and which is to mean more perhaps to architects than to the members of any other one profession. Its coincident demands upon them will be many, and in its gradual rounding into completeness they will find much for them of lofty inspiration.

to concrete paving slab-making plant it is claimed that 3,500 loads of clinker refuse can be converted into 34,240 yds. super. of paving slabs at the cost for labour and materials and interest and sinking fund of 3s. 3d. per yd. super., equal to the total cost of £5,564. The value of the manufactured paving slab is 4s. per yd. super., equal to £6,848. This gives a clear profit of £1,284, in addition to the saving of the cost of carting to Black Rock tip as at present £525, or a total sum of £1,809 per annum. The estimated cost of the clinker crushing plant is £855 10s., while that for the brick-making and drying plant varied from £2,250 to £3,570. It will thus be seen that the Brighton Corporation expect to reap a rich harvest from this little venture if it is carried out, but before finally deciding they have determined to send a deputation to the Hague where the process is in full operation.

A Fire-station at Blackstock Road, Islington, N., has been erected by the London County Council from designs by their superintending architect, Mr. W. E. Riley, F.R.I.B.A.

ground a high dado, with circular cornice, and covered with Anaglypta of simple but appropriate design. Adjoining the lodge-room will be the Tyler's store-room, 11ft. long by 4ft. wide, which will be well lighted, so as to enable it to be used as a dressing-room for visiting brethren. There will be another room, 17ft. by 15ft., entered from the landing, which will most probably be used as a library or reception-room. On the ground floor there will be a dining-room, 22ft. by 21ft. This will be entered from the vestibule through a lounge. Attached to the dining-room will be a service-room and kitchen, and between the dining-room and the hall will be a smoke-room, 16ft. by 11ft. The surplus space on the ground floor will be devoted to the construction of a good lock-up shop, 25ft. by 16ft., having windows into High and Water Skellgates. The contractors are: Messrs. Mitchell & Webster, Ripon, excavators, masons and bricklayers; Messrs. Clapham & Taylor, Harrogate, carpenters and joiners; Mr. W. E. Dixon, Ripon, plumber and glazier; Messrs. Coleman Bros., Knaresborough, plasterers; and Messrs. J. Baynes and C. Beck, Ripon, slaters.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Making a Damp Room Habitable.

LONDON, W.C.—H. S. writes: "How can I treat damp walls in order that a certain room may be safely used as a living room? In my house in Surrey, built on sand and gravel soil, I have a good-sized basement room entirely underground, but well lighted, which I wish to use as a study. At present this is impossible owing to the damp exuding from the walls. The house is very well built with 15in. hollow walls, and is everywhere else dry. How can I remedy this at a small cost? The walls are of brick plastered over, and the floor is tiled. There is no area around the room except for the windows."

I presume that the rainwater from the roof is caught in proper spouting, with joints and down-pipes in good order. The basement of your house is evidently damp both from (a) moisture rising from the bottom and from (b) moisture proceeding from the earth lying against the outer walls. It is impossible to remedy dampness in such a situation as this by any kind of solution or preparation applied to the face of the wall. The remedy for (a) is to cut out one course of brickwork all round both the exterior and interior walls, and to insert a proper damp-course—felt being probably the most convenient for use in such a position. The tiled floor should be replaced by one of wood blocks laid on a damp-proof foundation. (b) May be remedied by removing the soil now resting against the side walls, and substituting either (1) an earth batter sloping towards the house, and with efficient drainage at its toe, or (2) by forming a dry open area or covered air-drain (with proper drainage and ventilation) wherever the earth now touches the walls. In default of this rather expensive remedy, I suggest that you fix three battens about 3in. by 2in., in a horizontal position, to all the walls—duly tarring them at the back, or, better still, inserting a strip of damp-proof felt behind each. The lowest batten should be from 4in. to 6in. above the floor level, or it will probably suffer from damp. Upon these battens lay 6in. by 3in. grooved and tongued boarding in a vertical position, put a skirting at the bottom and cover the joint with the ceiling by means of a small wood fillet. This method of fixing will form a cavity behind the boarding, which must be thoroughly ventilated. The simplest way to do this is to remove a brick from the inner skin of the hollow wall (I presume it is hollow below the ground line) at intervals, in order that a draught may be created. The lowest openings should be immediately above the bottom batten; others should be above and below the middle batten, and the top row just below the top batten. It is not desirable that the openings should be exactly over one another, but care should be taken that every part of the boarding is ventilated, and special attention should be paid to the corners of the room where the woodwork is most liable to suffer from damp, coming as it does from both walls. The battens may with advantage be stopped an inch or so short of the wall, that there may be ventilation around their ends. The boarding may, for appearance sake, be sized and varnished, or may be painted if that be preferred. A boarded floor may be similarly formed by laying 4in. by 3in. or other suitable joists on the top of the tiles, preserving them against the rising damp by laying strips of felt between the tiles and each joist. Lay grooved and tongued floor boards on this in the usual way, and be very careful that no shavings or rubbish are left in the spaces between the joists, and that ventilation is possible all round the floor by communication with the cavity behind the upright boarding on the walls. For this purpose the joists should not be quite long enough to touch the wall at either end, and the last joist at each side should be an inch or two away from the wall to which it is parallel. As ventilation is the essential feature in this case, everything possible should be done to

secure its efficiency; and if it be possible at any point to obtain direct communication between the cavity and the outer air it should be done, iron gratings being fixed to prevent the ingress of vermin. G. S. M.

Employment for Architects Abroad.

CAMBRIDGE.—COSMOPOLITAN writes: "Is it practicable for an English architect to obtain a tolerably remunerative situation abroad, preferably in Switzerland? Would the fact of being a member of the R.I.B.A. and of the Architectural Association be of any advantage?"

We should not advise anyone to go abroad on chance as an architect or architect's assistant. In Switzerland it would of course be a primary necessity to know French thoroughly. A position might be secured through influence, and membership of the Institute would doubtless be of some advantage.

Ancient Lights.

LONDON, N.W.—A. M. writes: "I have heard and seen many definitions of 'ancient lights.' How long a time must elapse before such can be claimed? I have to design a house on a plot adjoining one on which a house has been built for eleven years. This house is at least 7ft. from the boundary line, and its height is about 25ft. What distance shall I have to keep between the two houses if I go to the same height?"

Twenty years' uninterrupted enjoyment of light through a window makes that window an ancient light. With regard to your second question, see the reply on p. 183 of our issue for April 10th, 1901.

Articles and Practice.

STAFFORD.—X. writes: "Would the lack of articles affect a pupil when he set up on his own account, and particularly in the event of the passing of the Registration Bill?"

No. As to the Registration Bill, we have several times stated that there is a clause in it that "any person who has served as apprentice or assistant to an architect for seven years in the aggregate, after having attained the age of fifteen years prior to the passing of the Act, is entitled to be registered."

Gallery for Chapel.

HULL.—STUDENT writes: "Kindly show a good and cheap method of constructing a gallery for a small chapel to go round three sides. The gallery to be 11ft. wide, and to have three tiers of seats."

See p. 77 of our issue for March 7th, 1900.

Carving Armorial Bearings.

NEWPORT, MON.—NIMO writes: "I am asked to carve armorial bearings in stone over a lodge entrance. Should the crest be omitted, or would it be correct to carve the crest, shield and motto as shown on the accompanying tracing (not reproduced)? Is there any rule governing this matter?"

Presuming that the person has a right to a crest, there is no rule governing the case. It is a matter of artistic taste. By all means carve the coat-of-arms with the motto on the scroll beneath; but if the crest is to be used reduce the size considerably, and place it in its proper position, on a helmet, resting on the top of the shield. Consult the really old heraldic carvings in churches, &c., or be guided by the excellent examples in Mr. Oswald Barron's "St. George's Kalender" (Constable & Co., ls.). You may carve the arms as in a "trick" drawing (that is, only showing the outline), or indicate the colours by the use of the prescribed lines and dots. G. C. R.

Tendering.

LLANELLY.—BUILDER writes: "A short time ago I tendered for some chapel work. The committee agreed to accept my tender. Shortly afterwards, and before signing the contract, I found I had omitted two items, about £42. I immediately wrote to the committee, but they then rejected the tender, stating that in the case of a tender being amended the work falls to the next. I then wrote stating I was prepared to abide by my original tender. The committee

replied that the work had been given into other hands. Can I not claim to perform the work at my original price?"

The committee have acted quite legally, and you can make no claim against them.

Institution of Civil Engineers.

M. D. writes: "Where can I obtain copies of papers set at former examinations for admission as student to the above Institution?"

A copy of the papers set at the examinations held in February last for candidates applying as student and associate members of this Institution can be obtained from the secretary, Great George Street, Westminster, S.W. All the other papers are out of print.

Openings for Architects' Assistants in South Africa.

PEACE writes: "Kindly give brief particulars regarding prospects in South Africa for architects' assistants."

In reply to a communication addressed to the Colonial Office, Mr. Chamberlain states that he is unable to make any general statement as to prospects for architectural assistants in South Africa, but that there is, no doubt, every prospect of business in the building trade becoming brisk as the country settles down.

Roof-Trusses by the Method of Sections.

KILMARNOCK.—H. D. S. writes: "Kindly supply some information with regard to the following example in statics taken from Rivington, IV., pp. 184-186 and 314, 315. (1) On p. 185 the rule for method of sections reads: "Sever the structure . . . cutting if possible through three bars" On p. 186: If (above) not possible the method must then be slightly modified. In the example given on p. 314 two bars only are severed, and I wish to know if the working out of this example conforms to method described on pp. 184-186. (2) Pages 314 and 315, Appendix XVIII., equation determining S A F:

$$8.53 \times 1.17 - 2.39 \times S A F = 0$$

$$9.97 - 9.97 = 0$$

$$\therefore S A F = +4.16 \text{ tons.}$$

Page 315, equation determining S A D:

$$10.35 \times 1.17 + 2.72 \times S A D = 0$$

Should this not read—

$$10.35 \times 1.17 - 2.72 \times S A D = 0$$

$$12.1 - 2.72 \times 4.16 = 0$$

$$12.1 - 12.1 = 0$$

$$\therefore S A D = -4.45 \text{ tons?}$$

(3) Is the — here and the + at (2) found by these equations or by consideration of the forces as positive or negative? (4) Is this explanation of the moments round the turning point *m* correct?"

In considering moments of forces the sign plus or minus depends upon the direction in which the force tends to cause rotation, clockwise being + and counter-clockwise —, but in the method of sections when a section line cuts a figure as Fig. 314, p. 185, "Notes on Building Construction," and the forces are all shown pulling away from the section, the parts in tension will be + or a positive pull and the parts in compression — or a negative pull, i.e., a push. In (2) R A acts clockwise and is therefore positive, S A F acts counter-clockwise and is therefore negative, but this is not the reason it is stated with a minus; thus $8.53 \times 1.17 - 2.39 \times S A F = 0$. The reason is that as one force tends to turn clockwise, and the other counter-clockwise, their moments must be equal, or the difference between their moments must be zero, as shown in the equation above. In (3) R A again acts clockwise, and S A D strictly counter-clockwise; but taking the latter force to be acting outwards from the frame, and clockwise as Fig. 314, then it is a minus force producing a minus moment. But the force S A D being assumed clockwise, the moment must be added to the moment of R A; thus, in the equation given $10.35 \times 1.17 + 2.72 \times S A D = 0$, transpose the terms thus, $10.35 \times 1.17 = -2.72 S A D$, divide both sides by —2.72, then

$$\frac{10.35 \times 1.17}{-2.72} = -S A D$$

It is to be hoped that you will now understand the explanations in the book, but the assumption that all forces act away from the line of section tends very much to confuse the subject.

HENRY ADAMS.

Bricks and Mortar.

APHORISM FOR THE WEEK.

There cannot be a more baneful error associated with initiation into art than the dangerous dogma that the aspirations of genius need not be trammelled by the labour of study.—GEORGE MOORE.

Our Plates. THE drawing of the studio alteration for Mr. W. H. Allen to the house at Farnham, Surrey, by Mr. Herbert Falkner, the architect, is a particularly bold piece of work: and as such it can be recommended to students for study. The manner in which the bricks are rendered is somewhat laborious, but the effect on the whole is good, while the freedom in the treatment of the sky shows what a command Mr. Falkner has over his pen.—“The White Cottages” have been erected in Austin Street, Hunstanton, Norfolk, for Mrs. Porter. The materials used are stock bricks covered with white rough-cast, with brown local stone dressings and grey-green slates on the roofs. Our illustration is from a water-colour drawing by the architect, Mr. Herbert Ibberson, F.R.I.B.A., of 28, Martin's Lane, E.C., and Cambridge. Messrs. George Chambers & Son, of Snettisham, Norfolk, were the builders.

Photography as a Fine Art. PROF. HALSEY C. LIVES, chief of the Department of Fine Art, and Colonel John A. Ockerson, chief of the Department of Liberal Arts of the Universal Exposition to be held at St. Louis in 1904, have been in conference with the leading photographic circles on the subject of the position of photography in relation to the painters' arts, and have decided that not only shall a full allowance of space be set aside in the Palace of the Liberal Arts for Photography, but they have also agreed to give a certain amount of room to the science in the Palace of Fine Arts. The Palace of the Liberal Arts is one of the big temporary buildings in the exhibition. In style the structure is French Renaissance with an inner cloistered court. It is to cost about £104,000 and will cover an area of 400,000 sq. ft., the façade being 150ft. long. The intention is to include in the scheme, on the architectural side, photographs of public buildings, hospitals and dwellings, with the laying-out

of grounds, parks, &c. In the Palace of the Fine Arts—a permanent gallery that will vie in size and grandeur with the Grand Palais in Paris, or with the stately buildings of the Imperial Art Museums, Vienna—the space set aside for the purpose in question will be, among other subjects, for “distinctive art photography,” which may either deal with landscape or the figure, and also for works produced by photo-engraving processes. All works will be subject to selection by a jury now in course of formation. A grand prize and gold, silver and bronze medals will be awarded, and diplomas issued. Intending competitors may like to know that the offices of Mr. George F. Parker, the resident representative in the United Kingdom of the Exposition, are at Sanctuary House, Tothill Street, Westminster, S.W.

Another Campanile Collapse.

THE following description (from an Italian periodical) of the fall of a campanile in Venice on December 13th, 1880, will be read with interest at the present time:—“Till yesterday there was in Venice a tower called Santa Trinita, which is said to have been built in the eleventh or twelfth century. To-day it is no longer in existence! . . . Yesterday about mid-day it began to show signs of insecurity, bits of mortar and fragments of brick began to fall, and from time to time ominous rumblings were heard. . . . All at once we saw the side of the tower give way. The tower moved, split in two about a storey above the ground upwards, the middle portion leaned forward, the part above fell perpendicularly upon it, one heard a fearful crash, and all was over in five seconds. A thick cloud of very white dust suddenly arose and covered us, the piazza, and the roofs of the houses like a snowstorm. . . . As it cleared away all that remained was a great heap of materials crushed, broken up and crumbled.”

Sir William Emerson's Liverpool Cathedral Designs.

SIR WILLIAM FORWOOD, in reply to Sir William Emerson's complaint that his drawings had been included with those now sent in for the new Liverpool Cathedral, stated that his committee called the first submission of drawings a competition (see p. 331 of our issue for last week). In reference to this Sir William Emerson further says: “It was always intended as such, though a preliminary

one, and I cannot understand his statement that in including my drawings among those gathered that this was my wish. In a letter of July 1st, in reference to the retention of my design, he said: ‘My committee do not propose to place them with those sent in to competition, but to retain them for reference. I understand you do not intend to compete again.’ My reply stated that I did not care to compete again. The committee, therefore, no right whatever to lay them before assessors or to include my name amongst a list of competitors, apart from any question of justice or injustice.”

The Mulready Prizes.

THE Council of the Society of Arts are prepared to offer under the terms of the Mulready Trust, a gold medal, or a prize of £200 in competition amongst students of the School of Art of the United Kingdom, at the annual National Competition to be held in 1903. The prize is offered to the student who obtains the highest awards in the following subjects:—(a) A finished drawing of imperial size from a nude living model; (b) a set of time studies on a small scale, from the nude living model, executed in a short time, of varied short-lived poses (mounted on not more than imperial size mounts); (c) a set of studies of hands and feet from the living model (mounted on not more than two imperial size mounts); (d) drawing from the life, including mechanical drawing done at the examination on May 1903.

The Growth of Vienna.

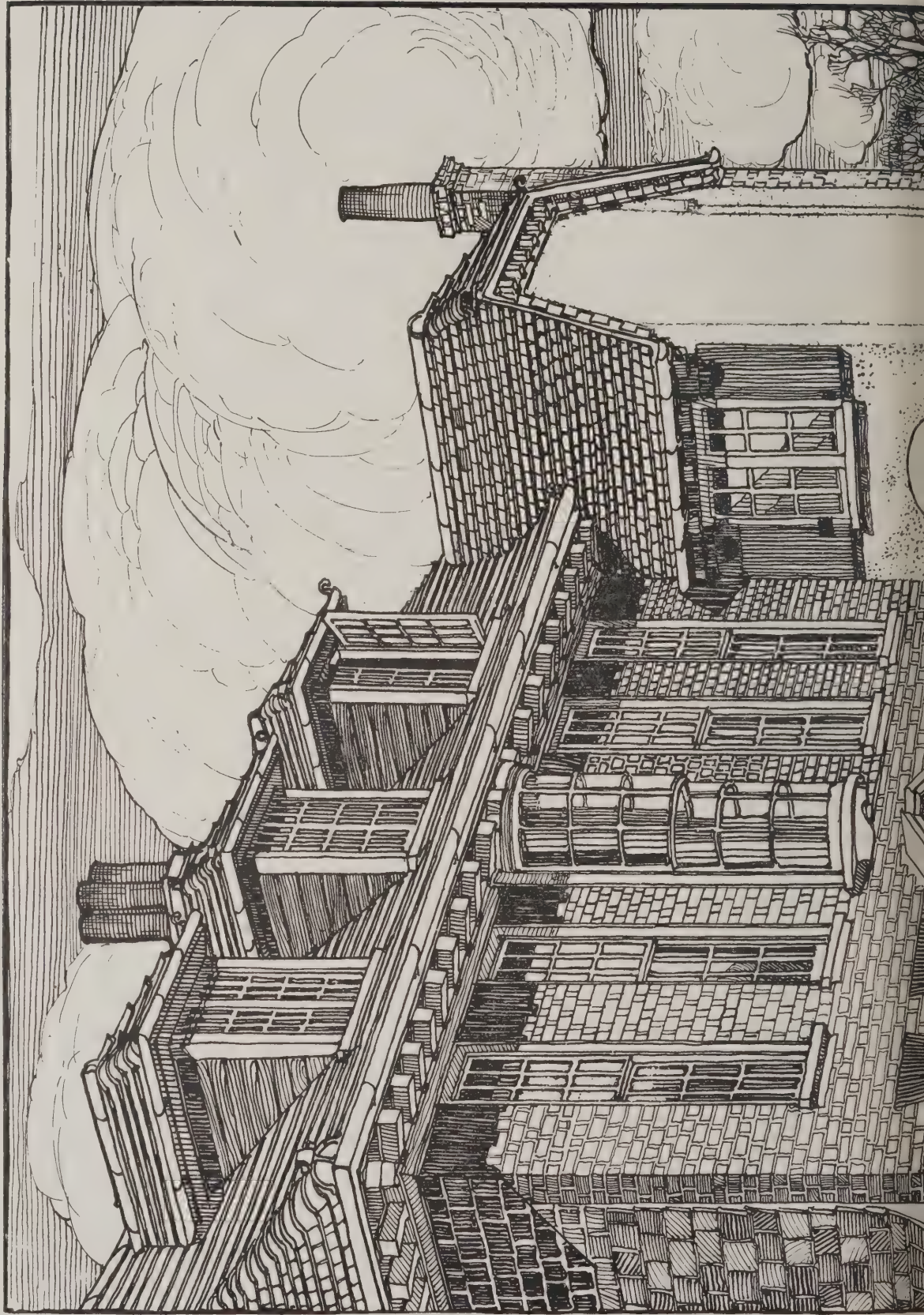
THE boundaries of Vienna proposed to be widened to an extent that the area of the Austrian capital will be almost doubled, will be second to that of London alone in Europe. Vienna, though it is called the Imperial City on the Blue Danube, lies, as a matter of fact, only on the right bank of that river, which forms the boundary on the north-west. A large semicircular area on the left bank, embracing the manufacturing town of Floridsdorf and other places, with a total area of 154 square kilometres, is now to be added to Vienna, which will raise its area from 178 to 332 square kilometres. The new districts, however, are thinly populated that they will add only 50,000 persons to the population of Vienna, raising it to about 1,800,000. The object of including a large tract, chiefly rural in character,

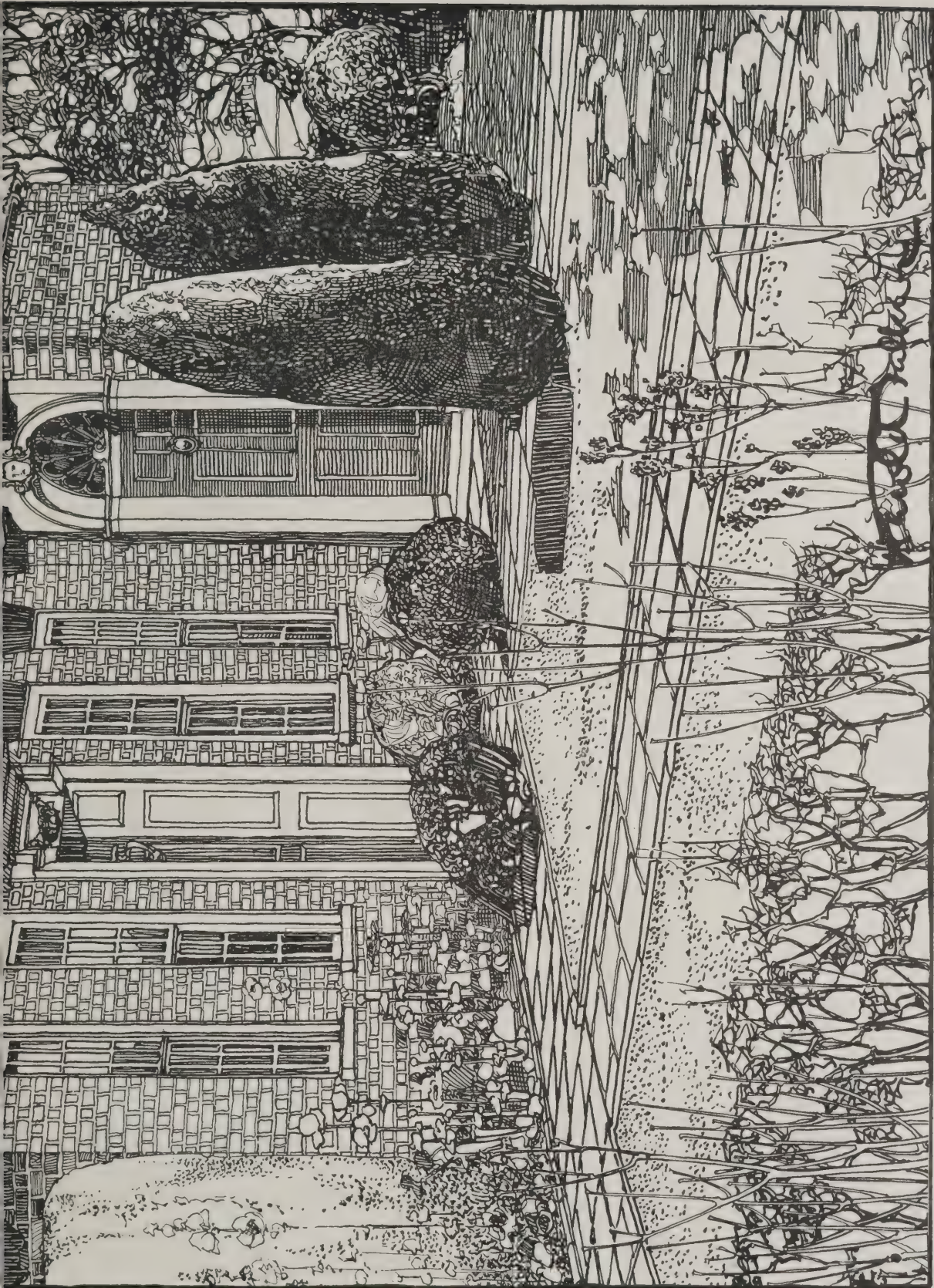


OLD SLAVE QUARTERS, STELLENBERG, NEAR WYNBERG, SOUTH AFRICA.

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Wednesday, August 6th, 1902.





"STRANGER'S CORNER," FARNHAM, SURREY : STUDIO ALTERATION. HAROLD FALKNER, Architect.

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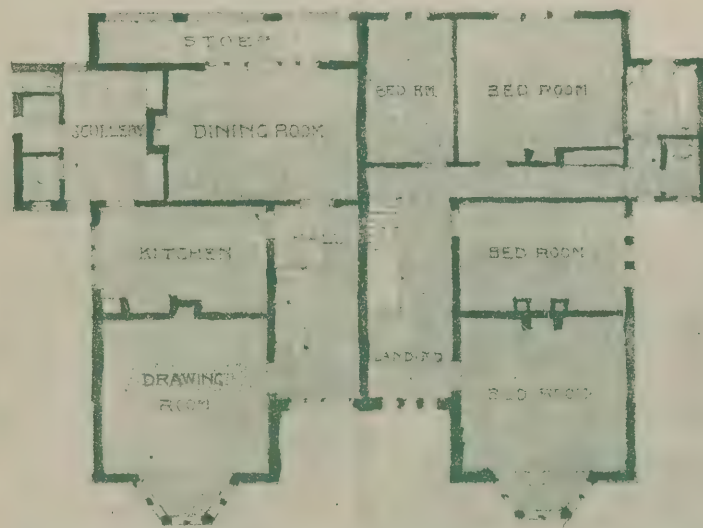
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GROUND FLOOR

FIRST FLOOR



THE WHITE COTTAGES HUNTANTON.
ARCHITECT.

H.C. IBBERSON.

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of it liable to periodical floods, is connected with the impending construction of the Danube Canal, which will enter the Danube at the town and within the new district, expected that it will create a large industrial area there. The old bed of the Danube, through which the river used to flow before its diversion, will be converted into docks and quays.

STELLENBERG FARM. Stellenberg Farm, near Wynberg, is a most interesting example of one of the old South African homes of the eighteenth century. The village of Stellenberg was founded in 1839 or 1840, and Stellenberg was the residence of Commissioner van der Stuurm in 1803. The plan is of the orthodox type, with the usual central hall or "voorkhuis," with a wing opening out of it on each side and carried as wing buildings in the rear and there connected by a wall with gate, thus forming an enclosed yard. The design of the bolts, door-latches and shutter catches are very quaint. The old slave quarters, illustrated on the previous page, form a delightful composition of thatch and red walls, wonderfully reminiscent of the rural houses of England.

Edinburgh Statuary. "It is to be hoped that the fashion set by a well-known citizen to perpetuate his name will not meet popular approval. By his will he decrees that the name of his heritable property shall be devoted to the erection of monuments and statues of himself and his relatives. No doubt it is a good thing that rising young sculptors should be encouraged; but if the bequest is carried out, it will have the sympathy of her neighbours. In Edinburgh would be glad to dispose of the name of her statues. Did not 'R. L. S.' speak of Nelson monument on Calton Hill as 'among the vilest of men's handiworks'? And Lord Abercromby was once heartily cheered when he jestingly stated that if the restless spirits that possessed the Gadarene swine were to enter into the statues of Edinburgh, and if the whole stony, barren troop were to hurry and hustle and file headlong down the steepest place near Edinburgh into the deepest part of the Firth of Forth, art would sustain no serious loss"—this is the "Daily Graphic."

Painted Wood-Screens. The Church of Tacolneston, in Norfolk possesses two fragments of its ancient wood-work—the lower parts only of the central screen on either side of the doorway. Mr. Edward F. Strange, assistant keeper in the National Art Library, Victoria and Albert Museum, recently read a short paper to the Society of Antiquaries giving the results of his examination of them. Two of the panels of one were elaborately painted as regards the framework with flowers and conventional ornament, heightened with gesso coloured and gilt, after the manner of the well-known examples at Ranthorpe, Southwold and other churches. But the end of this enrichment, which is probably of doubtful English origin, enclosing as in most cases formally-treated representations of figures, they have perfect pictures exactly in the style of the Flemish painters of 1450-1520. Mr. Strange has succeeded in identifying the subjects as an "Annunciation" and a "Temptation of St. Anthony," and has proved that the latter is an exact copy of the well-known engraving (plate 117) by Lucas Van Leyden, dated 1515. The other appears to be by the same hand, though its source has not yet been traced. The other panels have paintings. The importance of the discovery lies not only in the fact that it is the first painting of the kind which can be absolutely identified with a known work by a Flemish or other foreign artist; but that being so different from those generally found in the eastern counties it adds a strong argument to the theory that the latter were painted by British artists. It is hoped that additional light may be thrown on the question by identification of the other panel ("The Temptation of St. Anthony"). In any case the two ought to be highly among the fragmentary remains of pictorial art of the period, and one hopes they will now be carefully preserved from further decay or mutilation.

Law Cases.

Street Excavations: Action against Telephone Co.—The case of *Addison & Co., Ltd., v. National Telephone Co., Ltd., and J. A. Ewart* was heard at the Liverpool Summer Assizes last week. The case for the plaintiffs, who are wine merchants of Blackpool, was that without giving notice the defendants made an excavation in the pavement close to the gable-end of plaintiffs' premises to a depth of 2ft. 6in., which was deeper than the foundations of the building. No precautions were taken for propping up the wall, and the result was that a subsidence took place, cracking a plate-glass window, jamming a door and causing cracks in the walls. The gable wall sank, and drew the whole building in that direction. Plaintiffs contended it would have to be renewed at a cost of £100 to £150; £50 was claimed as compensation for disturbance of business and £100 for contingencies likely to arise in the reconstruction of an old building. It was deposed that the Corporation workmen took up the flags for the trench, and the telephone company's men had nothing to do with the direction of the trench. In excavating the men never saw the base of the wall. There was 6in. between the wall and the trench, and nothing to show they had gone below the foundations. Other evidence was to the effect that the building had "settled" before the trench was excavated.—The jury found for the plaintiffs, damages £250.

Engineering Notes.

Electric Traction for the North-Eastern Railway.—The North-Eastern Railway Company have decided to install electric traction on certain branch lines, commencing with the Newcastle to Tynemouth, the Gosforth to Ponteland, and the Quayside branches. This is the first English railway to adopt electric haulage.

The Institution of Junior Engineers.—The summer meeting of this institution commences on August 11th, the north-east Lancashire district being the locality to be visited, with Blackpool as headquarters. Excursions will be made to Barrow, Furness Abbey, Windermere and Preston. Mr. F. S. Pilling, M.I.E.E., of 39, Victoria Street, Westminster, has been appointed hon. local secretary of the meeting.

Tree Trunks as Water Mains.—In the course of laying new gas mains in Finsbury Pavement some old trunks of trees which were in old times laid as water conduits have been found. They were in a wonderful state of preservation though computed to have been 150 years in the ground. They are supposed to have been laid for the waters of the New River Company from the reservoir at Clerkenwell to the once fashionable parts of the City across Finsbury fields.

"Tube" Railway Construction.—In the course of the hearing by the Commons Committee of the Brompton and Piccadilly Railway Bill Mr. C. T. Yerkes gave some particulars of its construction. He said that the cars would be entirely fireproof, as they would be built of metal, asbestos and non-inflammable wood. The stations would also be fireproof. A system of ventilation had been arranged by which every mile of tunnel would be completely refreshed in forty-five minutes. The current would be introduced through a tube 4ft. in diameter.

The New Thames Tunnel from Greenwich to Millwall, constructed by Messrs. J. Cochrane & Sons for the London County Council, is now completed. It is 1,217ft. long, 11ft. diameter inside and 60ft. below high-water level. It has been driven with a "shield" under compressed air from the north side. The actual tunnelling under the river was done in the remarkably short time of eight months, the whole work occupying about three years. The entrance at each end is by a circular shaft (35ft. in diameter), with stairways and lifts. The entrance on the Millwall side is close to the North Greenwich Station; while the one at Greenwich adjoins the celebrated Ship Hotel. The tunnel is lighted throughout by electricity. The total cost is about £120,000. The total weight of cast-iron lining, in segments used in forming the tunnel, was 1,670 tons, faced with

180,000 white enamelled tiles. Seven miles of joints were used, and 150 tons of bolts, representing a length of five miles. In the entrance shafts, including stairways and domes, there are 800 tons of steel.

Surveying & Sanitation.

Motor-Cars for Surveyors.—The Surrey County Council has authorised the purchase of a motor-car, at a cost not exceeding £250, for the use of the county surveyor.

Epping Forest.—At a recent meeting of the Corporation of London the Epping Forest Committee were authorised to acquire and take over the management of about 802 acres of land formerly forming part of Hainault Forest. A contribution of £10,000 will be made towards the cost of the purchase money, £21,630.

No. 5 of the "Scientific Roll" has been published by Mr. R. L. Shorland, 38, Churchfield Road, Acton, W. The systematized notes on papers and books that have been published on bacteria are continued in this part. This magazine is indispensable to bacteriologists who desire an accurate and comprehensive record of the literature on bacteria and of discoveries in this branch of science.

West Strand Widening.—At a special meeting of the Westminster City Council held recently the Joint Committees of Works, Improvements and Highways recommended "that the draft agreement with the Worcester Buildings Co. for the acquisition of the land necessary to widen the Strand between the Hotel Cecil and Terry's Theatre to a uniform width of 80ft. for the sum of £90,000, submitted to the Council by the Improvements Committee, be ratified." This was agreed to.

Westminster Paving Contracts.—At last week's meeting of the Westminster City Council the paving of Downing Street was discussed. The Works Committee recommended that yellow deal blocks be laid by the Improved Wood Paving Co. at a total cost, including maintenance for fourteen years, of £1,200. Some of the members were for this course, some for sanitary asphalt blocks and some for American red gum. The result was a refusal to give any contracts for red gum, and the acceptance of the Improved Wood Co.'s tender.

Smoke Abatement.—Sir W. B. Richmond, R.A. writes: "In view of the many enquiries made by persons annoyed with smoke from factories, workshops, bakeries, and clubs or hotel chimneys as to the means of procuring abatement of the nuisance, the Coal Smoke Abatement Society venture to think that it may be useful to state the proper method of procedure for the purpose. Information of the date or dates, with time, place, and duration of the nuisance, should be addressed to the medical officer of health, at the town hall of the district in which the nuisance exists. Or, if it be preferred, the same information may be sent to the secretary of the Coal Smoke Abatement Society at 59, Chancery Lane, when the Society will take all steps to investigate the complaint, and if necessary to assist the local authority to enforce the law according to the Public Health Act (London), 1901."

Sewer Gas Poisoning.—What was described as the first case of death known to have resulted from sewer gas poisoning formed the subject of an inquest recently conducted by Dr. Gordon Hogg, the coroner for West Middlesex, at Chiswick. The deceased was Richard Coombes, who had been employed as a labourer by the Chiswick District Council. He was sent with two other men to do some work at some manholes in connection with sewers at Strand-on-the-Green, concerning which complaints of bad odours had been received by the district council. At a manhole at Herne Road the plate fell into the sewer and a fellow-workman volunteered to go down and get it. He handed this plate to the deceased, who remained at the top. Some hours later the deceased became very ill, and after nearly a fortnight he died. Dr. Fountain said that the death was caused by typhoid fever, which was due to poisoning by sewer gas, and the jury returned a verdict in accordance with this evidence.

Builders' Notes.

Tests with Automatic Fire-Alarms.—The British Fire-Prevention Committee devoted last Wednesday afternoon to tests with automatic fire-alarm systems (Pearson's) at their testing station at Bayswater. The arrangements were made as "natural" as possible, and in each case the alarms gave the necessary notice after a few seconds of smouldering fire, whereupon a period of three minutes was allowed to elapse to mark the time required to obtain indoor assistance. The fire was then extinguished by hand apparatus, the amount of water used and the damage done being minimal.

Handbook of Liverpool Building Regulations.—A manual of the building regulations in force in Liverpool, arranged and annotated by Mr. William Goldstraw, city building surveyor, with illustrative diagrams by Mr. James Dod, architect, surveyor to the Liverpool Exchange Co., has just been re-published. The work has been issued in two volumes, one containing the text and the other the diagrams. The first edition of the work was issued in 1882. The object of the compiler has been to furnish in the smallest form a code of all the building regulations in force in the city, whether in local or general enactments, with one important exception—namely, the Liverpool Fire Prevention Acts, 1843 and 1844.

Amended Building By-Laws for Birmingham.—The Public Works Committee reported to the Birmingham City Council last week that they had had under consideration the desirability of an amendment of the building by-laws, principally with a view to the removal of requirements originally insisted upon by the Local Government Board, but which have been found in operation to be unnecessarily severe and to increase the cost of building without any corresponding advantage. Amendments were accordingly prepared, and, with the addition of one or two new by-laws which have been found desirable, were submitted to the Local Government Board, to the Birmingham Architectural Association, and the Birmingham Master-Builders' Association. The Architectural Association did not offer any observations upon them, but the by-laws now submitted have been approved by the master-builders, and have been provisionally approved by the Local Government Board. The alterations embodied in the amended by-laws relate to foundations, thickness of walls and dimensions of open spaces at the front and rear of dwelling-houses, particularly in respect of exceptionally-shaped sites. The committee's proposals were approved. It is understood that with small houses the new regulations will save £10 in each case.

London County Council.—At last week's meeting of the Council an adjourned report of the Bridges Committee asked for a vote of £10,933 in settlement of contractors' extras in connection with the demolition of the old Vauxhall Bridge and the partial construction of the new one. This was recommended on the distinct understanding that the present contract will be completed this year, so that contracts for the superstructure of the bridge may be invited without further delay. Replying to a question by Mr. Beachcroft, Mr. Ward, on behalf of the Bridges Committee, was sorry to say there was likely to be a very substantial alteration in the plans for the erection of the bridge. The report was adopted.—The Highways Committee submitted revised estimates for tramways reconstruction and the establishment of an electricity generating station at Greenwich. The total amount now required was £981,497, as compared with the original estimates amounting to £623,500. An adjourned report of the same committee contained proposals for the construction of new tramways in various parts of London of a total length of 26 miles, and estimated to cost £971,450 for construction, £209,800 for cars, and £127,167 for street widenings, being a total of £1,307,917. The committee recommended that application be made to Parliament for the necessary powers. This was agreed to.—The Westminster Bridge Road scheme for connection with the Victoria Embankment via Westminster Bridge was approved.—The Building Act Committee called attention to the action of the Receiver of Police in causing a police-station at Bow Road to be

advanced 19ft. beyond the building line. They expressed regret at the attitude adopted by the police authorities. Dr. Longstaff pointed out that the railway company began the encroachment. The Labour members protested against passing the matter over, and the report was not dealt with.—The Council adopted a recommendation of the Parks Committee for the purchase of the Avery Hill estate at Eltham, and an estimate of the cost at £25,200 was approved.—The report of the special committee dealing with the site for a new county hall on the Embankment Gardens was postponed until after the recess.—The Council adjourned till October 7th.

A Big Blast at Tilberthwaite.—At Mossrigg Quarry, Tilberthwaite, the largest blasting operation attempted in that part of the country was recently carried out with great success. Mossrigg is a very old working belonging to the Tilberthwaite Green Slate Co.; it now presents an immense excavation 300ft. deep and 100yds. across at the top. At three different stages between the top and the bottom tunnels are driven inwards through the rock, so that from the subterranean and the open-air workings millions of tons of slate must have been removed. The object of the great blast was to dislodge a great mass, estimated at 40,000 tons, of rock which stood in the way of better material behind. The working at the bottom of the quarry had been conducted round a great pillar of rock which was left as a support of the mass above it, and which it was considered unsafe to undermine any further in the ordinary manner. As good slate exists in that direction, however, it was decided to blow out the pillar and bring down the vast face of rock resting upon it for the whole height of 300ft. To make assurance doubly sure the pillar and the superincumbent rock were alike prepared for blasting. Two months were spent in driving twenty-one holes varying in depth from 13ft. to 17ft. into the face of the rock, some perpendicular, some oblique, some horizontal, according to the cleavage planes of the surface. These holes were charged with a great quantity of powder expressly milled for the job, and fuses of a special kind were attached, terminating at the other end on a broad gallery near the top of the quarry and close to the mouth of the highest tunnel. The whole fell most satisfactorily.

A NEW MARKET.

A NEW cattle market at Truro has been erected at a cost of about £5,300. A central roadway 24ft. wide runs through the enclosure and forms the means of access to all parts. The area to the east of this road is laid out as a sheep market, penning accommodation being provided for 3,200 sheep, a proportion of the pens being fitted with auctioneers' walking boards. The pens are arranged in straight lines, back to back, gangways 8ft. 6in. wide dividing each group, whilst a central roadway 12ft. wide and a 9ft. gangway around provide adequate means of access. The area to the west of the 24ft. road is laid out for bullocks. Two auction rings are here provided, with arrangements for passing bullocks in and out singly. An iron roof covers the ring and standing space in each case, and rostrums are provided for the auctioneers. Bullock pens for private sales occupy a prominent position, and altogether there is provision for 650 bullocks. Advantage has been taken of the shelter afforded by the high western boundary wall to erect a continuous lean-to iron roof against it for a length of 180ft.; this will be utilised as a cow and calf market, a halter rail (to which the beasts may be tied) being fixed for the full length. An iron roof supported on steel columns covers the pens provided for the pig market. The whole of the ironwork in the pens for sheep, bullocks, pigs, &c., has been specially designed by the engineer, and is admirably adapted to the purpose. On the advice of the engineer the bullock market is paved with granolithic concrete, grooved at 5in. centres, whilst the sheep market has been paved with similar material, but not grooved. Paving for such a purpose must give a good foothold, be hard enough to resist wear, and, on sanitary grounds, be impervious to moisture—conditions that seem to have been met as far as possible.

The granolithic paving has been carried out by a Leicester firm, under the care of Mr. McDowell. The sheep pens are paved with Staffordshire blue bricks, and the pig pens are laid with Staffordshire blue bricks. The drainage of the market has been carried out on modern principles. A system of cast-iron water mains has been established all over the market, with facilities for thorough flushing. Adjoining the north entrance the cattle weigh-bridge, with office and conveniences, has been fixed. The office will be at the disposal of farmers and others doing business in the market. Close to the south entrance is a convenient unloading deck for cattle. The granite drinking-fountain that was so conspicuous at the top of Castle Hill has been fixed nearly in the centre of the market, and glazed earthenware drinking-troughs for cattle have been provided in other parts. The engineer for the market was Mr. Measham Lea, the city surveyor, who has superintended the carrying out of the undertaking. The whole of the contract was entrusted to Mr. J. Collier, of Truro.

New Patents.

These patents are open to opposition until September 9th.

1901.—Portland-Cement Manufacture.—10,958. E. H. HURRY, Bethlehem, and H. J. SEAMAN, Catasauqua; both of Pennsylvania, U.S.A. The object of this invention is to decrease the cost of manufacture. The cement material is mixed with coal or coke and melted with the aid of an air blast of about 15lbs. more pressure than that of the atmosphere. The molten material is drawn off, cooled, disintegrated and pulverised.

Cranes.—15,112. H. O. BALDREY, 21, Queen Anne's Gate, Westminster, S.W. A bucket ladder is hinged to the lower part of the crane jib, so that the apparatus may be used for excavation and similar work.

Circular Saws.—20,054. W. MILLER, 134 Elmbank Terrace, Falkirk. The saw is mounted on a ball and socket joint so that it may be tilted at any desired angle.

1902.—Concrete Bricks.—11,533. J. IMPSON, Crown Point, and H. JEWSON; both of Dereham. This invention relates to a press for concrete bricks. These bricks are hollow and have channels formed on the top and bottom faces and on two sides, so that when erected in a wall cement may be poured in from the top to secure the whole.

The following specifications were published on Thursday last, and are open to opposition until September 16th next. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1901.—12,724. HINDSHAW, plaster-of-Paris. 14,095, JOHNSON (*Avril & Soc. Marinier Navoit et Jeanson*), chiselling machine. 14,211, SMITH, measuring instrument for timber. 14,395, LOCHMAN, wood-carving machines. 14,958, BATE, WALTON & BAUER, ventilators. 15,575, COOLEY, pinning wood-block paving and floors. 16,788, ASKEW, ball-valves. 16,916, HEAP, roofing tiles. 17,022, LASCELLES, wood-flooring, paving, &c. 17,080, TAILBY, saw benches. 17,122, DUGON, metal dowel plates. 17,468, GAFFNEY, guiding devices for folding and sliding partitions. 17,554, WALKER, brick presses. 17,694, NOBES & COLLINS, water supply. 17,707, COOKSEY, pipes. 17,746, MCKIBBIN, jointing device for water-closets. 17,916, ADAMS, pipe joints. 18,077, STEINBACH & DUBERSTADT, mixture of asphalt and other substances. 23,475, SMITH & STALEY, sanitary pipe machines. 26,526, LAKE (*Smith*), sluice valves.

1902.—3,531. KRÖNING & HOFFMANN, jointless floors. 5,437, LEGG, water-heating apparatus. 5,924, RHODES & RHODES, hanging of sliding window-sashes. 8,463, BERRY & LAWES & Co., LTD., heat non-conducting compositions. 9,330, PETR, organ pipes. 9,846, WILCOX, rack-pulleys for window-blinds. 11,141, KERR, windows. 11,610, DEAN & PALMER, pipe joints. 12,198, HADDAN (*Schaar*), sash windows. 12,567, COOK, opening and closing doors.

THE PERMANENCY OF STEEL CONSTRUCTION.

AN article by Mr. J. K. Freitag on the above subject appeared in a recent issue of "The Brickbuilder," of Boston, U.S.A., suggested by an address delivered by General William Sooy Smith before a Chicago institution. A paper on the same subject was read by General Smith some years ago before the Western Society of Engineers. From that paper we quote as follows:—

"The rate of corrosion of iron and steel varies greatly under different circumstances. In pure water containing no free air, with an air-tight covering of paint or imbedded in quicklime, it scarcely corrodes at all, but when in the open air, particularly when alternately wet and dry, it rusts quite rapidly, and when exposed to steam and sulphurous fumes it is eaten away by corrosion at the rate of $\frac{1}{32}$ in. per annum, as was the case in the floor system of the viaduct in Milwaukee Avenue, Chicago, under which locomotives were passing frequently; and corrosion at the same rate occurred in a portion of the western approach of the Eads bridge at St. Louis, where the same circumstances exist.

"As the metal in a steel column is usually not more than $\frac{3}{8}$ in. thick, corrosion at the above rate would make a steel building unsafe in less than twenty years.

"In an iron or steel skeleton building the columns starting at the basement floor or at the floor at street level extend to the top of the building. They are hollow and painted only on the outside and this with paint that is so perishable that it will afford no protection from corrosion after the first five or ten years. The girders are nearly as much exposed as the columns, while the beams are generally bare on the top and bottom surfaces of the flanges and sometimes over a considerable part of the webs."

Commenting on this Mr. Freitag says:—

It is manifestly unfair to make any comparison between the rates of corrosion for viaducts over railroads and for buildings, but here we seem to have one of the principal arguments upon which General Sooy Smith bases his prediction of failure of buildings "in less than twenty years." Again, the mention of floor beams which "are generally bare on the top and bottom surfaces of the flanges and sometimes over a considerable part of the webs," and the mention of columns which are assumed to be protected by a doubtful coating of paint only, indicate most exceptional practice, if indeed precisely such cases could be found.

Mr. Post's Experience.

Examples from building practice of actual corrosion have from time to time been brought to public attention by architects and engineers, notably in discussions on the permanency of skeleton construction before the American Institute of Architects and before the American Society of Civil Engineers. In the former instance the principal example of corrosion was cited by Mr. Post, where the condition of certain beams taken from the old New York Times Building was mentioned. These iron beams, which had been in use for twenty-five or thirty years, had carried brick arches over a boiler-room and kitchen, and the unprotected lower flanges, exposed to the action of steam and cooking gases, were found to be nearly destroyed, while the corrosion had also extended upwards between the iron and brickwork until the beam webs were almost entirely worthless.

Other similar instances of corrosion were brought forward at this discussion, and, without a single exception, their unprotected condition could lead to nothing but deterioration sooner or later. But such examples as these are about as worthless as the comparisons to railroad viaducts, and that Mr. Post attached no importance to the action of such unprotected members may be judged from his later statements before the American Society of Civil Engineers, when he said:—

"While the speaker was not a great admirer of steel in concrete, the evidence of the last few years seemed to him to prove forcibly that where iron or steel is in direct contact with masonry it is thoroughly protected from corrosion. In pulling down the first 'Herald' building, which was more than thirty years old, he directed the

inspector to bring him the worst corroded pieces of iron he could find in the building. There were no bad examples found, and where the mortar had been in absolute contact with the paint, the paint itself was preserved. All the reliable evidence obtainable goes to prove that cement mortar has the faculty of preserving iron and steel to a great extent from corrosion, and certainly of preserving from injury the paint which it covers."

Iron Preserved a Thousand Years.

Such testimony as this from the very wide experience of Mr. Post, and the testimony of others who have cited remarkable instances of the preservation of iron within cement or concrete—as, for instance, Mr. W. L. B. Jenney, who mentions the excellent condition in which a piece of iron was found after being imbedded about a thousand years beneath the Egyptian obelisk now in Central Park, New York; and the practically perfect condition recorded of iron after a four hundred years' entombment in cement-concrete beneath water—such testimony must show that the reasonable permanency of the better class of skeleton construction is not only possible but probable.

Causes of Corrosion.

The principal deterioration to be feared is rust, due either to lack of initial protection of the steelwork, to moisture arising from the employment of mortar during building, or to moisture which either penetrates the protective coverings during service or else emanates from piping within the structure.

Considering now the phenomenon of rusting, we know that iron and steel are but very slightly oxidised or rusted under the action of pure air or pure water, but when the air becomes moist so that it condenses on the surface of the metal, or when water becomes impure or acidulated, oxidation is speedily established, and when once started the ultimate destruction of the metal is assured unless the process is arrested.

It is now generally considered that under usual conditions the corrosibility of cast iron, wrought iron and steel will be about the same. Under very trying conditions, as for instance, in salt water, cast iron will show the best results, but in protected building work the reliability of steel far offsets any possible slight advantage which cast iron might possess in the power of endurance.

The Envelope.

In selecting the class of masonry or terra-cotta to be used it should be remembered that limestone must never be employed in locations where there is any possibility of contact with the steelwork or where moisture could penetrate the joints and then reach the steel frame, for experience has shown that anchorage cables of suspension bridges have been badly corroded and even entirely severed where embedded in limestone masonry or concrete made with limestone. If limestone is used, a thick layer of cement mortar should first surround the metalwork. Brickwork should be built of dense and hard brick with a vitrified appearance and with a minimum of soluble salts. Terra-cotta protections should preferably be of a porous variety, both on account of the ready evaporation of moisture from the mortar used in setting and the evaporation of penetrating dampness from without, to say nothing of fireproofing qualities. Regarding lime versus cement mortar there are great differences of opinion. Many claim that lime mortar is an excellent preservative of steel, and this opinion is believed to be substantiated by examples. Other authentic cases, however, tend to show that, under certain conditions at least, lime mortar is not to be depended upon. On the other hand cement mortar or concrete is now generally regarded as a most perfect conservator of iron and steel. Mr. Post's conclusions as to cement mortar have been previously quoted, and Mr. J. Newman states that "iron imbedded in properly made and mixed water- and air-tight Portland cement-concrete has not yet been shown to rust, and the preservative effects of such concrete may be considered to be established, provided the surface of the metal was clean and dry on the Portland concrete coating being applied and free from corrosion."

Precautions.

Proper materials, however, may be rendered nugatory through improper usage. A few words, therefore, concerning the methods of use to

secure both initial protection and permanent effectiveness.

When delivered from the rolls which form them to the cooling beds, all steel plates and shapes are largely covered with scales which are only partially attached to the surface and hence form cracks for the ready formation of rust. If such plain material is then handled or stored out of doors before being painted, rust will quickly start beneath the scales, and if allowed to become well developed any subsequent painting will never arrest the oxidation which proceeds under cover of the paint. The first essential, therefore, for effective painting is the early removal of all mill scale, rust, grease, &c. A coat of pure boiled linseed oil is generally specified for the material before shipment, to be followed as soon after erection as practicable by at least two coats of different colours of almost any of the better grade paints, oxide of iron, red lead, asphalt or graphite paints, provided the oils and pigments used are of the best quality, and provided the painting is done in dry weather on dry surfaces.

In designing the steelwork a minimum area should be presented to corrosive influences, as the ratio of exposed surface to sectional area largely determines the amount of the corrosion. The practice of using very thin columns of large areas in exterior walls, like vertical plate girders, is to be avoided, as this presents large areas to exposure and possible corrosion. Columns should be as compact as possible, open where practicable, in order that all surfaces may be protected. When used in closed or boxed section the interiors should be filled with cement mortar or concrete.

In using masonry or terra-cotta envelopes or coverings, either exterior or interior or around foundation members, the function of excluding all possible moisture or air should be borne in mind. The masonry should be thick enough, laid in cement mortar, all joints carefully laid and repointed from time to time, and where in contact with the steel a heavy coating of cement mortar, asphaltum or other impervious covering, preferably a casing of hollow terra cotta laid in cement mortar, should first surround the metalwork. Floors should protect the entire beam or girder surfaces, the upper and lower flanges as well as the webs; and column coverings should extend from floor to floor without any holes or openings at the various floor levels.

The architects, Messrs. Holabird & Roche, who have designed many notable high buildings in Chicago, state as the result of their extended practice: "We have found that in fireproofing, wherever the terra-cotta shapes are so arranged that the entire surface of the beams, girders, columns, &c., is covered with the mortar or cement in which the fireproofing is to be set, practically no oxidation takes place, and that such beams, girders and columns are in perfect condition after twelve to fifteen years; while beams, girders and columns that are simply protected without having the mortar in contact with the steel have been found somewhat seriously oxidized."

Finally, the detrimental radiation of moisture or the leakage of gases from pipes, vents, &c., can be avoided by placing all piping in separate chases, shut off from the metal columns by means of masonry or terra-cotta coverings. In many early examples of high building work the piping was run up alongside the metal columns, within the same enclosure, and certain column forms have been recommended for use because they allowed space between the flanges for the running of pipes. The writer even knows of instances where the column cap-plates were cut with slotted holes to permit pipes to pass up close to the shaft. This is a most dangerous practice, and owners of buildings where such methods have been followed would do well to make investigations without delay.

The conclusion therefore seems tenable that skeleton construction can be made safe and permanent. There are certainly flagrant examples of poor, cheap and even insecure construction, but wide-sweeping condemnations of skeleton methods cannot be drawn from the shortsighted practice of careless or ignorant investors. If the proper materials are used, with adequate care for initial protection and for permanent preservation, there seems to be no reason to question the ultimate wisdom of present conservative methods.

BUILDING NOTES AND MEMORANDA.—VII.

By T. E. COLEMAN, F.S.I.

(Concluded from p. 370, No. 389.)

THE following is the remainder of the list of items and prices given as indicating the average cost of builder's work in the London district, except where otherwise described. The prices quoted for "labour" and "labour and materials" respectively include the contractor's allowance for profit, use of plant, &c.:—

Carpenter and Joiner.

	Per ft. cube.	
	Labour.	Labour and materials.
<i>Fir timbers.</i>	s. d.	s. d.
Fir in lintels, wall-plates, &c.	0 6	2 6
Fir framed in floor-joists	0 8	2 9
Ditto in rafters, partitions, &c.	0 9	2 10
Ditto in roof-trusses	1 1	3 4

	Per square.	
	Labour.	Labour and materials.
<i>Centering, &c.</i>	s. d.	s. d.
Centering for concrete flats, including fixing and removal	6 0	18 0
Ditto ditto wrought one side, with flush joints and ditto	7 3	22 0
Centering for plain arches or vaulting and ditto	9 0	27 0
Ditto for large plain groined arches and ditto	13 0	39 0

	Per ft. super.	
	Labour.	Labour and materials.
<i>Centering to trimmer arches, including fixing and removal</i>	d.	d.
Ditto to door and window openings and ditto	5	8

	Per yd. super.	
	Labour.	Labour and materials.
<i>Casings.</i>	s. d.	s. d.
Casings for concrete walls, including fixing and removal	0 8	2 0
Ditto, ditto wrought one side, with flush joints and ditto	0 10	2 6

	Per square.	
	Labour.	Labour and materials.
<i>Deal boardings and floors.</i>	s. d.	s. d.
¾ in. rough boarding laid complete as to roofs, &c.	2 6	16 0
1 in. ditto ditto	2 8	20 0
1½ in. ditto ditto	2 10	25 0
¾ in. white deal machine-prepared grooved and tongued floor boarding laid complete in batten widths to floors, &c.	5 3	25 6
1 in. ditto ditto	5 6	27 0
1½ in. ditto ditto	5 9	29 0
1 in. ditto ditto	6 0	31 6
¾ in. yellow deal ditto ditto	5 3	29 0
1 in. ditto ditto	5 6	31 0
1½ in. ditto ditto	5 9	33 0
1 in. ditto ditto	6 0	36 0
¾ in. yellow deal machine-prepared weather-board-ing fixed complete with 1½ in. laps	3 6	22 0
1 in. rough gutter-boarding with framed bearers	0 4	0 8

	Per ft. super.	
	Labour.	Labour and materials.
<i>Deal doors.</i>	s. d.	s. d.
¾ in. rough-ledged door, including hanging	0 1½	0 4
1 in. ditto ditto	0 2	0 5

	Per ft. super.	
	Labour.	Labour and materials.
¾ in. wrought, matched and beaded ledged door, including hanging	s. d.	s. d.
1 in. ditto ditto	0 3½	0 6
Add if braced	0 3½	0 7
1½ in. wrought, framed and braced door or gate, including hanging	0 7½	1 0
2 in. ditto ditto	0 8½	1 2
2½ in. ditto ditto	0 10	1 4
3 in. ditto ditto	0 11	1 6
1½ in. framed 4-panel square and flat door, including hanging	0 7½	1 0
1½ in. ditto ditto	0 8	1 1
2 in. ditto ditto	0 9	1 3
Add for each side if moulded	0 1	0 1½
Ditto ditto, if bolection moulded	0 1½	0 2½
Add to preceding items, if hung folding	0 1	0 1
Add if framed in 6 instead of 4 panels	0 ¾	0 1
Add for each side if bead flush	0 ¾	0 1

Sashes and frames.

Deal-cased frame with oak sunk and weathered sills, 1½ in. deal moulded sashes double-hung with brass pulleys, flaxlines, cast-iron weights, &c., complete	0 11	1 6
Ditto ditto, with 2 in. deal moulded sashes	1 0	1 9
Ditto ditto, with 2½ in. deal moulded sashes	1 2	2 0
Fir proper casement frames with oak sunk and weathered sills, 1½ in. deal moulded casements and hung	0 9½	1 4
Ditto ditto, with 2 in. deal moulded sashes	0 11	1 7

	Per ft. run.	
	Labour.	Labour and materials.
<i>Door and casement frames.</i>	d.	s. d.
4 in. by 2½ in. fir wrot., framed, rebated and beaded or chamfered frames fixed complete	2½	0 5
4½ in. by 3 in. ditto ditto	3	0 6
5 in. by 4 in. ditto ditto	4½	0 9
7½ in. by 4 in. ditto ditto	7	1 2
9 in. by 5 in. ditto ditto	9	1 6

Founder and Smith.

	Per cwt.	
	Labour fixing.	Labour and materials.
<i>Cast-iron.</i>	s. d.	s. d.
Cast-iron in furnace bars, ash weights, &c.	—	7 6
Ditto in joists, girders, &c., and fixing	1 6	10 6
Ditto in columns, complete with caps, bases, &c.	2 6	12 6
Ditto in framing, gratings, &c., as for staircases, &c.	3 6	17 6

	Per yd. run.	
	Labour.	Labour and materials.
<i>Cast-iron pipes. As for water mains, &c.</i>	s. d.	s. d.
2 in. cast-iron pipes (coated with Dr. Angus Smith's process) laid complete, including running joints with lead and caulking	0 6	3 6
3 in. ditto ditto	0 5	4 0
4 in. ditto ditto	0 6	5 0
6 in. ditto ditto	0 8	8 0
9 in. ditto ditto	0 10	13 0
12 in. ditto ditto	1 0	19 0
15 in. ditto ditto	1 3	27 0
18 in. ditto ditto	1 7	33 6
24 in. ditto ditto	2 6	55 0

	Per ft. run.	
	Labour.	Labour and materials.
<i>Eaves gutters.</i>	d.	s. d.
3 in. half-round eaves guttering with wrought-iron brackets and fixed complete	1½	0 6
4 in. ditto ditto	2	0 7
5 in. ditto ditto	2½	0 10
4 in. ogee eaves guttering and fixed with screws complete	2	0 8
5 in. ditto	2½	0 11

Note.—Extra only for each angle, outle, or stopped end, price as list of pipe

Rainwater pipes.

2 in. diameter rainwater pipes with ears and fixed complete	1½	0 7
3 in. ditto ditto	2	0 9
4 in. ditto ditto	2½	1 0
Extra for swan-necks, plinth bends, shoes, &c., to 2 in. diam. pipes	2	0 7
Ditto ditto, 3 in. ditto	3	0 10
Ditto ditto, 4 in. ditto	4	1 6

Wrought-iron service pipes.

¾ in. wrought-iron pipes with screwed ends, including bends, elbows, connectors, &c., fixed complete	2½	0 6
1 in. ditto ditto	2½	0 7
1½ in. ditto ditto	3	0 8
2 in. ditto ditto	3½	0 9
2½ in. ditto ditto	4	0 11
3 in. ditto ditto	4½	1 2
4 in. ditto ditto	5½	1 6

Plasterer.

	Per yd. super.	
	Labour.	Labour and materials.
<i>Walls.</i>	s. d.	s. d.
Rendering with hair mortar	0 5	0 9
Render 1 coat and set with fine stuff	0 7	1 0
Render, float, and set with fine stuff	0 10	1 4
Ditto ditto, and set with putty and plaster	1 0	1 7
Parian cement brought out with Portland cement	1 6	3 0
Keene's ditto ditto ditto	1 6	3 0
Render 1 coat with half Portland cement and half sand ¾ in. thick, including smooth-trowelled face	1 0	2 0
Render and float with half Portland cement and half sand ¾ in. thick, including smooth-trowelled face	1 4	2 10
Ditto ditto 1 cement to 2 sand ditto ditto	1 4	2 4

Ceilings and partitions.

Lathing	0 5	0 8
Lath and plaster 1 coat	0 10	1 5
Lath, plaster and set with fine stuff	1 0	1 8
Lath, plaster, float, and set with fine stuff	1 3	2 0
Ditto ditto, and set with putty and plaster	1 5	2 3

	Per in. girth.	
	Labour.	Labour and materials.
<i>Cornices and mouldings.</i>	d.	d.

Plain cornices and mouldings in plaster	0½	1½
Ditto ditto in Portland cement	1	1½

	Per ft. run.	
	Labour.	Labour and materials.
<i>Cornices and mouldings.</i>	d.	d.
Bead and quirk under 2 in. girth in plaster	1½	2
Ditto ditto in cement	2½	3½
Double or staff bead under 3 in. girth in plaster	2½	3½
Ditto ditto in cement	3½	4½

	Per yd. super.	
	Labour.	Labour and materials.
<i>Colouring, &c.</i>	d.	d.
Limewhiting 1 coat - -	0 ½	1
Ditto 2 coats - - -	0 ¾	1 ¾
Distemper in colours 1 coat	0 ¾	2 ½
Ditto 2 coats - - -	1	3
Clearcole and whiten ceilings	1 ½	3 ½
Scraping wall, ceilings, &c., add	1 ½	1 ½
Washing and stopping walls, ceilings, &c., add	1 ½	2

Plumber.

	Per cwt.	
	Labour.	Labour and materials.
<i>Sheet lead.</i>	s. d.	s. d.
Milled sheet lead in gutters, flats, flashings, &c. -	6 0	26 0
Ditto in cisterns, safes, sinks, &c., but exclusive of soldered joints -	7 6	27 6

Lead service pipes.

	Per ft. run.	
	Labour	Labour and materials.
<i>Lead service pipes.</i>	s. d.	s. d.
½ in. light lead pipe and fixing, including running joints, bends, wall hooks, &c. - (1lb. per ft. run)	0 2 ½	0 7 ½
¾ in. ditto (1 ½ lbs. ")	0 3	0 9 ½
1 in. ditto (2 ½ lbs. ")	0 3 ½	1 0
1 ¼ in. ditto (3 lbs. ")	0 4	1 3
1 ½ in. ditto (4 lbs. ")	0 4 ½	1 7
2 in. ditto (5 lbs. ")	0 5 ½	2 0
¾ in. strong ditto ditto (2 lbs. per ft. run)	0 3	0 9 ½
¾ in. ditto (3 lbs. ")	0 3 ½	1 1
1 in. ditto (4 lbs. ")	0 4	1 4
1 ¼ in. ditto (5 ½ lbs. ")	0 4 ½	1 8
1 ½ in. ditto (6 lbs. ")	0 5	2 0
2 in. ditto (8 lbs. ")	0 6	2 6

Lead soil and ventilating pipes.

2 in. drawn lead pipe (8 lbs. thickness) fixed with lead tacks spaced 3 ft. apart, including running joints, but exclusive of bends, &c. -	0 7	2 6
2 ½ in. ditto ditto ditto -	0 8	2 9
3 in. ditto ditto ditto -	0 9	3 0
3 ½ in. ditto ditto ditto -	0 10	3 3
4 in. ditto ditto ditto -	1 0	3 6
5 in. ditto ditto ditto -	1 3	4 0
6 in. ditto ditto ditto -	1 6	4 6

Bends on 2 in. lead ventilating and soil-pipes

Ditto on 2 ½ in. ditto -	-	2 6
Ditto on 3 in. ditto -	-	3 0
Ditto on 3 ½ in. ditto -	-	3 6
Ditto on 4 in. ditto -	-	4 0
Ditto on 5 in. ditto -	-	5 0
Ditto on 6 in. ditto -	-	6 0

Each.

	Per ft. run.	
	Labour.	Labour and materials.
<i>½ in. soldered joints</i>	s. d.	s. d.
½ in. ditto -	0 5	1 3
¾ in. ditto -	0 6	1 6
1 in. ditto -	0 7	1 9
1 ¼ in. ditto -	0 8 ½	2 0
1 ½ in. ditto -	0 10	2 6
2 in. ditto -	1 0	3 0
2 ½ in. ditto -	1 2	3 6
3 in. ditto -	1 4	4 0
3 ½ in. ditto -	1 6	4 6
4 in. ditto -	1 8	5 0
5 in. ditto -	2 0	5 9
6 in. ditto -	2 4	6 6

Per ft. run.

	Per ft. run.	
	Labour.	Labour and materials.
<i>C.I. soil and ventilating pipes.</i>	s. d.	s. d.
3 in. cast-iron pipes fixed complete, including joints run with lead, but exclusive of bends, junctions, &c. (40 lbs. per 6 ft. length) -	0 6	2 3

	Per ft. run.	
	Labour.	Labour and materials.
<i>3 ½ in. cast-iron pipes fixed complete, including joints run with lead, but exclusive of bends, junctions, &c. (48 lbs. per 6 ft. length) -</i>	0 7	2 6
4 in. ditto (54 lbs. per 6 ft. length) -	0 8	2 9
5 in. ditto (69 lbs. per 6 ft. length) -	0 10	3 3
6 in. ditto (84 lbs. per 6 ft. length) -	1 0	3 9

Brass-work.

	Each.	
	s.	d.
½ in. brass union for lead pipe and fixed, including soldered joint -	3	0
¾ in. ditto -	4	3
1 in. ditto -	5	6
1 ¼ in. ditto -	7	0
1 ½ in. brass washer and union, with brass plug and chain, including fixing to slate or earthenware -	9	6
3 in. diam. brass grating and fixing, including soldering -	2	6
½ in. brass H P. stop-cock, and fixing with two soldered joints -	7	0
¾ in. ditto ditto ditto -	9	6
1 in. ditto ditto ditto -	13	6
½ in. ditto bib cock, and fixing with one solder joint -	5	6
¾ in. ditto -	7	6
1 in. ditto -	12	0
½ in. brass ball cock with copper stem and ball, and fixing complete -	5	6
¾ in. ditto -	7	6
1 in. ditto -	12	6

Painter.

	Per yd. super.	
	Labour.	Labour and materials.
<i>Plain painting.</i>	s. d.	s. d.
Knot, stop and paint 1 coat plain painting -	0 3	0 5
Ditto ditto 2 coats -	0 4 ½	0 8
Ditto ditto 3 coats -	0 6	0 10
Ditto ditto 4 coats -	0 7	1 0
Burning off old paint and preparing for new -	-	1 6

Pipes, skirtings, &c.

	Per yd. super.	
	Labour.	Labour and materials.
<i>Pipes, skirtings, &c.</i>	s. d.	s. d.
Scrape, prepare, and paint 1 coat on eaves gutters, rain-water pipes, &c. -	0 1 ½	0 2
Ditto ditto 2 coats -	0 2 ½	0 3 ½
Ditto ditto 3 coats -	0 3 ½	0 5
Ditto ditto 4 coats -	0 4	0 6

Scrape, prepare, and paint 1 coat on small pipes, shelf edge, &c. -

Ditto ditto 2 coats -	0 0 ¾	0 1
Ditto ditto 3 coats -	0 1	0 1 ½
Ditto ditto 4 coats -	0 1 ½	0 2

Knot, stop and paint 1 coat on skirtings, mouldings, &c., in detached work not exceeding 12 in. wide, including cutting in both edges -

Ditto ditto 2 coats -	0 2 ½	0 3 ½
Ditto ditto 3 coats -	0 3 ½	0 5
Ditto ditto 4 coats -	0 4	0 6

Door-frames, &c.

Knot, stop and paint 1 coat on sash or door-frames (one side) -	0 5 ½	0 8
Ditto ditto 2 coats -	0 8 ½	1 0
Ditto ditto 3 coats -	0 11	1 3
Ditto ditto 4 coats -	1 1	1 6

Knot, stop and paint 1 coat on sash squares (one side) -

Ditto ditto 2 coats -	0 0 ½	0 0 ¾
Ditto ditto 3 coats -	0 ¾	0 1 ¼
Ditto ditto 4 coats -	0 1	0 1 ¾
Ditto ditto 4 coats -	0 1 ½	0 2 ¼

Writing.

	Per inch.	
	s.	d.
Writing plain letters or figures -	-	¾
Ditto shaded -	-	1 ¼

Varnishing, &c.

Stain, size and varnish 1 coat copal varnish -	0 6	1 0
Ditto ditto 2 coats ditto -	0 8	1 6
Grain oak, and varnish 1 coat copal varnish -	1 6	2 0
Ditto ditto 2 coats ditto -	1 8	2 6

Glazier.

	Per ft. super.	
	Labour.	Labour and materials.
<i>French polishing</i> -	4	0 7
15oz. 3rd quality sheet-glass and glazing in squares not exceeding 3 ft. super -	2	0 4 ½
21oz. ditto ditto -	2 ½	0 6
26oz. ditto ditto -	2 ½	0 7
32oz. ditto ditto -	2 ¾	0 9 ½
15oz. 3rd quality ditto exceeding 3 ft. and not exceeding 6 ft. super -	2	0 5 ½
21oz. ditto ditto -	2 ½	0 7
26oz. ditto ditto -	2 ½	0 8
32oz. ditto ditto -	2 ¾	0 10 ½
15oz. best quality sheet-glass, and glazing in squares not exceeding 3 ft. super -	2	0 6
21oz. ditto ditto -	2 ½	0 7 ½
26oz. ditto ditto -	2 ½	0 8 ½
32oz. ditto ditto -	2 ¾	0 11
British polished plate-glass best glazing quality about ¼ in. thick, and glazing in squares not exceeding 3 ft. super -	4	2 3
Ditto, exceeding 3 ft. and not exceeding 6 ft. super -	4	2 4
Ditto, exceeding 6 ft. and not exceeding 12 ft. super -	4	2 6
Ditto, exceeding 12 ft. and not exceeding 25 ft. super -	5	2 9
Ditto, exceeding 25 ft. and not exceeding 50 ft. super -	5	3 0
Patent rolled rough plate small fluted glass ¼ in. thick, and glazing in squares not exceeding 10 ft. super. -	3	0 7
Di to ditto ¼ in. thick, and ditto -	4	0 10
Ditto ditto ¼ in. ditto ditto -	5	1 2

	Per ft. run.	
	s.	d.
Circular cutting and risk on sheet glass -	1 ½	
Ditto on polished plate glass -	4	
Ditto on ¼ in. rolled rough plate -	3	

	Per ft. super.	
	s.	d.
16oz. cathedra'-tinted glass and glazed in quarry-shaped lead lights, including cementing, banding, and wiring complete -	1	10
Ditto in plain geometrical design -	from 3	0

	Per ft. super.	
	s.	d.
16oz. sheet cathedral glass, any tint and glazing in squares not exceeding 5 ft. super. -	0 2 ½	0 8
21oz. ditto ditto -	0 2 ½	0 9

Paper-hanger.

	Per piece or doz. yd. run.	
	s.	d.
Trimming and hanging common wall-papers -	0	9
Trimming and hanging full or half-satin papers in good work, including pumicing and sizing walls -	1	4
Add extra for papering on ceilings -	0	3
Add extra for stripping off old paper, including washing, stopping and preparing old walls to receive new paper -	0	10

	Per ft. super.	
	Singles.	Doubles.
Preparing and gilding plain work in best oil gold leaf -	3 0	4 6

	Per ft. run.	
	Singles.	Doubles.
Ditto on mouldings ¼ in. girth -	0 2 ½	0 3 ½
Ditto ditto 1 in. girth -	0 4 ½	0 6

	Per inch.	
	Singles.	Doubles.
Ditto plain letters or figures -	0 1 ¾	0 2 ½

Keystones.

A New Board-room at the Selby Workhouse has just been completed by Mr. Thomas S. Ullathorne, builder, of Selby.

Messrs. Thurston's New Premises, 46, Leicester Square, W.C.—Messrs. Edmund Wimperis & East are the architects of this building, not "Wimperis & Arber," as stated on p. 381 of our last issue.

Royal Archaeological Institute. — Sir Henry Howarth has been re-elected president of this Institute for the current triennial period. Several places have been suggested as the venue of next year's meeting, among them being Oxford, Newport (Mon.), Worcester and York. The selection is left to the Council.

A New Technical School at Haslingden, Manchester, is being built from designs by Mr. J. Singleton Green, the borough surveyor. The cost will be about £6,770. Mr. T. Collinge, Haslingden, is executing the brick and mason work, &c., and Mr. T. Tattersall the carpentry and joinery.

"Pressridge," Forest Row, Sussex.—With reference to the illustration of this design in our centre plates last week Mr. Edmund Fisher, the architect, states that the house shown in no way represents the building at present in course of erection, except in so far as it serves to explain Mr. Mawson's interesting garden plan.

The next Eisteddfod Pavilion.—Material progress has been made in the erection of the vast pavilion in the Bishop's Park, Bangor, for the holding of the National Eisteddfod in September next. The contractors are Messrs. R. & J. Williams, and the architect is Mr. Frank Bellis. The pavilion is of wood with a galvanised iron roof.

Manchester Royal Infirmary Scheme.—At last week's meeting of the Infirmary Board Mr. O'Hanlon asked that the plans for the erection of the infirmary on the Stanley Grove site which were prepared in 1895, and which were at present in existence, might be placed in the board-room, and that the Press be requested to state that any trustee could see them there. This motion, however, was defeated.

A Church with Ten Floors of Offices above.—The Broadway Tabernacle, the famous Episcopal church which has been a landmark in New York during the last half-century, is to be pulled down. The new Broadway Tabernacle will be capped by a ten-storey office structure! The church portion of the building will include, besides the church proper, a spacious auditorium, a chapel, a gymnasium, a Sunday-school room and a banquet hall.

The King's Sanatorium.—A site of 120 acres at Lords Common, near Midhurst, Sussex, has been selected for the King's sanatorium, the erection of which was made possible by the munificence of Sir Edward Cassel. It would be difficult to find a more healthy site, as the elevation ranges from 500ft. to 600ft. above the sea-level and is in the midst of charming scenery and a pine forest. The contract for the water-supply has been entrusted to Messrs. Duke & Ockenden, of Littlehampton and London, who are commencing operations immediately.

A New Convalescent Home at Llandudno is being built by the Forester Charity Trustees on the slopes of Little Orme, at an estimated cost of £70,000. Accommodation will be provided for about fifty patients. In the centre will be the administration block, containing apartments for the matron and staff, offices, &c.; the north wing will be occupied by the women and children, and the south wing by the men. A dining hall 50ft. by 80ft. is to be built. Electricity will be supplied from the municipal works for lighting purposes, and also for working the electric lift. The day-rooms open upon stone colonnaded balconies, which are a good feature of the design. Mr. E. B. I'Anson, of London, is the architect, and Messrs. Brown & Son, Salford, are the contractors. The grounds have been laid out and planted with shrubs from the designs and under the supervision of Mr. W. Pierce Williams.

Discovery of a Statue.—At Boscoreale, near Naples, a splendid statue of "Hercules in Repose" has been discovered. It is in excellent preservation, and is of the same artistic style as the Farnese Hercules in the Roman Museum.

The Liverpool Queen Victoria Memorial.—A further postponement has taken place of consideration of a proposal to employ a portion of St. George's Church site for the purposes of underground lavatories. This is the selected site for the Queen Victoria Memorial.

A Jewish War Monument.—A tablet in memory of the Jewish soldiers who fell in the South African War has been presented to the Kimberley New Synagogue. The surrounding design in Parian marble is being prepared at Kimberley. The whole of the "Latten" brasswork has been designed, carved and engraved by Mr. Gawthorpe, of Long Acre, art-metal worker to the King.

An Asylum for Paying Patients has been built by the West Riding County Council on the estate of Scalebar Park. The buildings, which are capable of accommodating 105 cases of each sex, have been designed by Mr. J. Vickers Edwards, C.E., the county surveyor, and comprise several detached blocks or villas. The lowest rate of admission is £1 5s. per week, but the committee reserve the right to reduce this amount under special circumstances in a limited number of cases.

The Wakefield Cathedral Extensions continue to make satisfactory progress. Since Whiteutide a vast amount of work has been accomplished, although externally the amount is hardly appreciable, the greater part of the labour having since then been confined to filling in the ornamental tracery of the windows and the various niches in the east end. The two transept aisles are now nearly up to the parapet levels. The walls of the new organ-chamber are now complete, and nothing remains to be done to that portion of the work but the roofing and the interior fittings. The interior work done also includes a considerable advance with the building of the interior columns or piers, and in some cases the arches are already in position.

Bradford Town Hall.—A scheme for extending the Bradford Town Hall has been prepared by the city architect, Mr. F. E. P. Edwards, A.R.I.B.A. The leading feature is the erection of an elaborate suite of municipal offices at the rear of the town hall, which are to be connected with the main building by two wings across each end of Chapel Lane. The narrow roadway would thus be stopped up and the centre portion remain open as a light well for the rooms, with windows overlooking the present street. The new council-chamber is placed in the extension on the first floor overlooking the well referred to and running parallel to the rear of the town hall proper. The extension is to be in two sections, with a well in the centre for lighting purposes.

New Business Premises in Bristol.—Messrs. Bartlett & Son, Ltd., Bristol, scale and weighing machine manufacturers, grocers' engineers and shop fitters, have now completed and occupied their new works, which they have for some time past been erecting off the Bath Road. The site has a frontage to the North Somerset branch of the Great Western Railway of 750ft. The works themselves cover a floor space of 500ft. by 130ft. and were designed throughout with the idea of having all the workmen on the ground floor. The buildings consist of a central warehouse of three floors, each 120ft. by 35ft. These are divided up into the various offices, warehouses and forwarding departments, the works, managers' and drawing offices being on the ground floor and communicating directly with the works; with the managing director's, general and other offices on the first floor. The warehouses divide the works into two distinct parts; on the left the wood shop-fitting department, and on the right the iron and brass foundries and the various fitting shops. Heating is by a low-pressure hot-water system installed by Messrs. Crispin & Sons. Messrs. Bartlett were their own contractors, the various buildings having been erected under the supervision of a competent clerk of works. Mr. J. Craik, architect, was responsible for the plans and foundations. The buildings are in red brick from the Shortwood Brick Co. (facings) and the Bristol Brick and Tile Co. (stocks).

A Bust of Mr. Cecil Rhodes has been executed by Mr. Adams Acton.

The New Campanile of St. Mark, according to "Punch," should be called the I-Fall Tower.

The Stamford Memorial Competition has been decided in favour of Mr. J. C. Traylen.

West Hartlepool Higher Grade School Competition.—Sixty-eight designs have been submitted in this competition.

New Buildings at Adel Reformatory, near Leeds, are now in course of erection. Messrs. T. Winn & Sons are the architects.

The Statue of General Hoche, the last work of Dalou—as General Gordon's was that of Onslow Ford—was lately inaugurated with great ceremony at Quiberon.

Southwark Town Hall.—The old Newington Vestry Hall, which since the creation of the new borough of Southwark has been used as a town hall for the enlarged municipality, is to be further extended at a cost of £14,000.

A New Police Station at Southminster, Essex, has been erected from designs by Mr. Frank Whitmore, architect, of Chelmsford. Messrs. Harris & Rowe, of Shoeburyness, were the contractors.

The death is announced of Mr. G. G. Stanham, of Glenthorne, Grove Park, Chiswick, at the age of seventy-five. Mr. Stanham retired from practice as an architect and surveyor sixteen years ago, his son succeeding him.

A Descendant of Wren.—Mr. Wren, the private secretary of Mr. Schwab, the Steel Trust King, is a lineal descendant of the architect of St. Paul's. It is said that Mr. Schwab pays him a salary of £3,000 a year.

The South Transept of Chester Cathedral, which has been restored at a cost of £10,000 as a memorial to the late Duke of Westminster, was dedicated on Thursday last. A recumbent effigy of the late Duke, by Mr. Pomeroy and Mr. C. J. Blomfield, has been placed in the chancel, and was unveiled before the service.

No. 37, New Bond Street, W.—In the article on "Recent Street Architecture in London" in our last issue these premises were described as a tea-house. The upper part only is let as such, the lower part (which is the main feature) forming the Woodbury Gallery of Messrs. Eyre & Spottiswoode.

"Picturesque Westminster," which has been produced by Mr. Walter Emden, L.C.C., is a portfolio of sketches illustrating famous landmarks and places of interest. Mr. Emden's purpose has been to present an artistic record of the City of Westminster in the Coronation year, especially in view of the changes now taking place and the impending demolitions. The illustrations are by Mr. Howard Penton, accompanied by notes by Mr. G. P. Warner Terry.

Pudsey Building By-laws.—The Pudsey Town Council have under consideration certain alterations to the building by-laws. Owing to some stringent clauses it has been claimed that the building trade of the town has been impeded for the past two years to a considerable extent, and to meet the wishes of architects and builders the committee suggest that the strength of timbers, which hitherto has been of one standard for all buildings, shall be left to the discretion of the Council. The amount of air-space has to be regulated by the number of storeys instead of by the height of the building, and the air-space may be partly at the rear and partly at the side, but not less than one half at the rear.

A New Church at Bryn, Glamorganshire, has just been completed. The style adopted is the lancet period of the Early English Gothic. The church is built of native stone with Bath-stone dressings (the interior being lined with red bricks). The roof is of planed pitch-pine framing open to the ridge, supported with hammer-beam trusses and covered with red tiles. The floors are paved with tessellated tiles, and the windows glazed with leaded cathedral glass. The church will seat 650 persons, and has been carried out by Messrs. Lattery Brothers, of Cardiff, from designs by and under the superintendence of Messrs. Frank B. Smith & Co., of 10, Warwick Court, London, and Port Talbot. The cost will be about £6,500. Lighting is by acetylene gas.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
BUILDING:			
Aug. 7	Aberdare—School	Aberdare School Board	T. Roderick, Clifton Street, Aberdare.
" 7	Firsby—Chapel	"	H. Smith, Firsby, near Seagness, Lincs.
" 7	Southend-on-Sea—Cookery Centre	School Board	W. Y. Hobbiss, 77 High Street, Southend-on-Sea.
" 7	Cardiff—Warehouses	"	Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff.
" 7	Dewsbury—Weaving Shed	"	J. Kirk & Son, Architects, Dewsbury.
" 7	Glasgow—Convenience	Corporation	Office of Public Works, City Chambers, 61 Oochrane St., Glasgow
" 7	Rochdale—Flooring at Hospital	Health Committee	S. S. Platt, Town Hall, Rochdale.
" 9	Scammonden—Alterations to Hotel	"	J. Kirk & Sons, Architects, Huddersfield.
" 9	Aspatia—Houses and Shops	"	G. Armstrong, Architect, 24 Bank Street, Carlisle.
" 9	Hoole—Walling	Urban District Council	Clerk's Office, 17 Newgate Street, Chester.
" 9	Maesteg—Rebuilding Hotel, Shop, &c.	"	J. Cook Rees, Architect, Neith.
" 9	Woodford—School	"	E. Tidman, 34 Victoria Street, Westminster, S.W.
" 9	Yeovil—Dwelling house	School Board	No. 30 Kingston, Yeovil.
" 9	Hertford—Alterations to Lodge at Workhouse	Rural District Council	Russell Austin, 13 Villiers Street, Hertford.
" 9	Ipswich—Electricity Generating Station, &c.	Guardians	Town Clerk, Town Hall, Ipswich.
" 9	Newtownards—Disinfecting House	Corporation	Clerk's Office, Board Room, Newtownards.
" 11	Barranagh (Queen's County)—Alterations to Bridge	Rural District Council	County Surveyor, Court House, Maryborough.
" 11	Northallerton—Extensions to Shed Premises	County Council	Thomas Winn & Sons, 92 Albion Street, Leeds.
" 11	Chesterfield—Infirmary, Nurses' Home, &c.	J. Wilfrid & Sons	Rollinson & Son, 13 Corporation Street, Chesterfield.
" 11	Bishop's Stortford—Boundary Wall	Union Guardians	Manager at the Works, Bishop's Stortford.
" 11	Tywardreath, Cornwall—Schools	Gas Company	W. J. Samble, Hill House, Par Station, Cornwall.
" 11	Holmfirth—Three Houses and Shop	School Board	Petty & Ives, Architects, 12 Waterhouse Street, Halifax.
" 11	Ebbw Vale—Coach-house, &c.	"	House-Agent's Office, Ebbw Vale, Mon.
" 11	Bishop Auckland—Alterations at Colliery	H. Stobart & Co., Ltd.	F. H. Livesay, Architect, Bishop Auckland.
" 11	Manchester—Foundations at Gaythorn Station	Gas Committee	J. G. Newbigging, Rochdale Road Station, Manchester.
" 12	Swansea—Office at Station	Directors, G.W.R.	Engineer, G.W.R. Station, Neath.
" 12	Chacewater—Additions to Stations	Directors, G.W.R.	Engineer, G.W.R. Station, Plymouth.
" 12	Cahir, co. Tipperary—Post Office	"	H. Williams, Office of Public Works, Dublin.
" 12	Ipswich—Inland Revenue Office	Commissioners	H.M. Office of Works, Storey's Gate, Westminster, S.W.
" 12	Manchester—Joiner's Work and Tiling at New Baths	Corporation	General Superintendent, Osborne Street Baths, Manchester.
" 13	Crumlin, Mon.—Villa	"	R. L. Roberts, Architect, Crumlin, Mon.
" 14	Willington—Church	"	John Kelly, 466 Oxford Street, London, W.
" 14	Barnes—Infants' School	School Board	O. Jones, 50 Cannon Street, E.C.
" 14	Streatham—Fire-Brigade Station	London County Council	Architect's Department, 3 Warwick Street, Charing Cross, W.C.
" 15	Pontypridd, Mon.—Buildings, &c., at Electric Station	Urban District Council	Reginald P. Wilson, 66 Victoria Street, Westminster, S.W.
" 15	Mullingar—College	Rev. Dr. Gaffney	J. J. O'Callaghan, 16 Nassau Street, Dublin.
" 16	Swadlincote Baptist Church—Enlargements	"	C. Coulton, 88 Oxford Street, Charing Cross, W.C.
" 18	Abergavenny—Stone Bridge and Wall	Rural District Council	John Gull, 4 Brecon Road, Abergavenny.
" 18	Cardiff—Basements, Foundations, &c., at Asylum	Corporation	Oatley & Skinner, Edinburg Chambers, Baldwin Street, Bristol.
" 18	Aberaman—Hotel	"	L. Smith & Davies, Architects, Aberdare.
" 19	Bosfrankan—Stable, &c.	Right Hon. Viscount Falmouth	Farmhouse, Bosfrankan, Cornwall.
" 27	Newport, Mon.—Lunatic Asylum	Corporation	Borough Engineer, Town Hall, Newport, Mon.
" 28	Bristol—Foundations, Subways, &c.	Corporation	H. Faraday Proctor, City Electrical Engineer, Temple Back, Bristol.
Sept. 11	Hackney—Coal Stores	Borough Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
ENGINEERING:			
Aug. 7	King William's Town, South Africa—Plant	King Electric Lighting and Cold Storage Co., Ltd.	A. E. Booth & Co., 43 New Union Street, Moorfields, London, E.C.
" 7	Ware—Lighting Streets	Urban District Council	G. H. Gisby, Town Hall, Ware, Herts.
" 7	Newport, Mon.—Tramway Reconstruction	Corporation	Borough Engineer, Town Hall, Newport, Mon.
" 8	Restronguet (Cornwall)—Water Supply	Rural District Council	J. H. Chubb, Belmont, Penryn, Cornwall.
" 9	Bethesda, Wales—Waterworks Alterations, &c.	Urban District Council	D. G. Davies, Clerk, Bank Chambers, Bethesda.
" 11	Cardiff—Dredger	Cardiff Railway Co.	Henry Lee, Engineer to the Company, Bute Dock, Cardiff.
" 11	Leeds—Subway	Unhealthy Areas Committee	City Engineer's Office (Unhealthy Areas Improvement Dept.), Municipal Buildings, Leeds.
" 11	Aston—Covering Boilers at Workhouse	Guardians	Workhouse, Gravelly Hill, near Birmingham.
" 12	Cork—Electrical Plant at Asylum	Committee of Management	H. A. Cudler, Municipal Buildings, Cork.
" 13	Wolverhampton—Electric Lighting Installation	Guardians	Arthur Marshall, King Street, Nottingham.
" 14	Andover—Steel and Concrete Bridge	Rural District Council	J. Wormald, South Cottage, Andover.
" 14	Kilkenny—Well	Rural District Council	Kieran Comerford, Clerk to Council, Kilkenny.
" 15	London—Bridges	County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 15	London, S.W.—Economisers	County Council	County Hall, Spring Gardens, S.W.
" 16	Whitwick—Railway	Whitwick Granite Co. Ltd.	Company's Office, Whitwick, near Leicester.
" 19	Ilford—Tramway Watering Car	Urban District Council	W. C. O. Hawtayne, 9 Queen Street Place, London, E.C.
" 21	Selangor, Malay States—Electrical Plant and Materials	Crown Agents for Colonies	Crown Agents for the Colonies, Downing Street, S.W.
" 21	Ikeston and Heanor—Waterworks	Urban District Council	G. & F. W. Hodgson, Engineers, Loughborough.
" 23	Colchester—Alterations to Pumps	Town Council	O. E. Blind, Town Hall, Colchester.
" 23	Malvern—Electricity Supply Works	Urban District Council	H. P. Maybury, Engineer, Council House, Malvern.
" 24	London—Dredging Thames	Conservancy	Thames Conservancy Offices, Victoria Embankment, E.C.
Sept. 1	Valparaiso, Chile—Electric Tramways	"	Chilian Consulate, 10 Lime Street, E.C.
" 3	Leicester—Electrical Tramway Works	Tramway Committee	E. G. Mawbey, Town Hall, Leicester.
" 4	Swansea—Hydraulic Accumulators, &c.	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
" 4	Swansea—Drawbridge	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
" 14	St. Petersburg, Russia—2 Bridges over River Neva	"	The Delegation Municipale, St. Petersburg.
" 15	Launceston, Tasmania—Electric Power Transmission	Mayor and Aldermen	J. Terry & Co., 7 Great Winchester Street, E.C.
" 15	Cairo—Widening Canal	Ministry of Public Works	Inspector of Irrigation, Projects Circle, Minia.
" 30	Port Adelaide, South Australia—Harbour	"	Agent-General for South Australia, 1 Grosvenor Square, London.
Oct. 7	Newcastle-on-Tyne—Electrification of Line	Directors, N.E.R.	Wilson Worsdell, N.E.R., Gateshead-on-Tyne.
IRON AND STEEL:			
Aug. 13	London, W.—Girders, &c.	Directors, G.W.R.	Engineer's Office, Paddington Station.
" 23	Prenzlau—Rails, &c.	"	Mr. Langenbein, Kreiseseisenbahn-director, Prenzlau, Germany.
" 30	Pietermaritzburg—Rails, &c.	"	Ford Brothers, 12 Southampton Street, Fitzroy Sq., London, W.
" 30	Karlsruhe—Six Locomotive Boilers	"	State Railway, Karlsruhe, Germany.
" 31	London, E.C.—Wheels, Axles, &c.	Great Indian Peninsula Railway Co.	Secretary's Office, 43 Copthall Avenue, London, E.C.
Sept. 1	London, S.W.—Rails and Fishplates	"	Agent-General for Victoria, 15 Victoria Street, S.W.
No date.	Johannesburg—Manhole Covers, Columns, Joists, &c.	Municipality	E. W. Carling & Co., St. Dunstan's Buildings, St. Dunstan's Hill, E.J.
PAINTING AND PLUMBING			
Aug. 8	Swindon—Repairing, &c., at Queen's Hotel	"	R. J. Beswick, 35 Regent Street, Swindon.
" 9	Poplar, E.—Painting, &c., at Town Hall	Borough Council	Harley Hecker, Council Offices, High Street, Poplar, London, E.
" 11	Jarrow—Repairing Lamps	Borough Sanitary Authority	Borough Surveyor, Acacia House, Jarrow.
" 11	Leeds—Painting at Municipal Buildings	Corporation	City Engineers, Town Hall, Leeds.
" 15	London, S.W.—Repainting Chelsea Bridge	County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
ROADS AND CARTAGE:			
Aug. 7	Wanstead, Essex—Granite Edge Kerb	Urban District Council	O. H. Bressay, Surveyor, Council Offices, Wanstead, N.E.
" 7	Llantrisant—Road	Urban District Council	B. Lawrence & Son, Austin Friars, Cavers, Dock St., Newport, M.M.
" 9	Huntingdon and Ely—Works, Repairs and Materials	War Department	Col. G. Barker, Royal Engineer Office, Colchester.
" 11	Belfast—Setts	Harbour Commissioners	G. F. Giles, Harbour Engineer, Belfast.
" 11	Jarrow—Kerbing, &c.	Urban Sanitary Authority	J. Petree, Acacia House, Grant Street, Jarrow.
" 11	Tring—Repaving, &c.	Urban District Council	Surveyor's Office, Council Offices, Tring, Herts.
" 11	Hitchin—Granite	Urban District Council	Council Offices, Town Hall, Hitchin.
" 11	Ilford—Levelling Roads	Urban District Council	Surveyor, Town Hall, Ilford.
" 11	Loughborough—Laying Saus	Town Council	A. H. Walker, Town Hall, Loughborough.
" 12	Coveatry—Making-up	Corporation	J. E. Swindlehurst, St. Mary's Hall, Coveatry.
" 12	Epping—Making-up	Urban District Council	Surveyor's Office, Epping.

COMPLETE LIST OF CONTRACTS OPEN—continued

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
ROADS AND CARTAGE—continued.			
Aug. 12	Halifax—Paving	Highways Committee	James Lord, Borough Engineer, Town Hall, Halifax.
" 13	Cheadle—Levelling, &c.	Urban District Council	G. F. Brady, Architect, Little Underbank, Stockport.
" 15	London, S.W.—Repairing	County Council	Engineer's Department, County Hall, Spring Gardeau, S.W.
" 19	Bishop's Stortford—Granite, Gravel, &c.	Urban District Council	Thomas Swatheridge, Council Offices, Bishop's Stortford.
" 19	South Mimms—Granite, &c.	Rural District Council	G. Dickinson, Byfield, 16 High Street, Barnet, Middlesex.
" 20	Portsmouth—Paving, Gravel, &c.	Corporation	Surveyor, Town Hall, Portsmouth.
SANITARY:			
Aug. 7	Sedgefield—Outfall Works	Rural District Council	Balfour & Son, 3 St. Nicholas's Buildings, Newcastle-on-Tyne.
" 9	Clown, Chesterfield—Sewer	Rural District Council	G. Hazledine-Barber, Engineer, Holm Hill, Clown.
" 9	Leith—Sewer	Town Council	Burgh's Surveyor's Office, Town Hall, Leith.
" 11	Bridgwater—Sewer	Rural District Council	W. A. Collins, 120 West Street, Bridgwater.
" 11	London—Main Drain, &c., at Homerton Workhouse	Guardians	J. Johnson, 47 Mark Lane, E.C.
" 13	Ulverston—Sewerage Scheme	Rural District Council	W. F. T. Molineaux, 3 Benson Street, Ulverston.
" 14	Much Wenlock—Laying Pipes, &c.	Sanitary Committee	G. C. Cooper, Town Clerk, Much Wenlock, Shropshire.
" 16	Bierton—Sewer	Rural District Council	W. E. Stanley, Bierton Road, Aylesbury.
" 16	Cudworth—Scavenging	Urban District Council	W. E. Bailey, Clerk to the Council, Barnsley.
" 18	Heywood—Sewers	Town Council	J. Diggle, Hind Hill Street, Heywood.
" 18	Sevenoaks—Sewer	Urban District Council	S. Towison, Council's Offices, Sevenoaks.
TIMBER:			
Aug. 7	Milford Haven—Jarrah Wood	Urban District Council	T. H. Lewis, Council Offices, Milford Haven.
" 9	London, E.—Jarrah Blocks	Poplar Borough Council	Harley Heckford, Council Offices, High Street, Poplar, E.
" 30	Pietermaritzburg—Sleepers	Corporation	Ford Brothers, 12 Southampton Street, Fitzroy Square, Soudon, W.
No date.	Birmingham—Timber	School Board	J. A. Palmer, School Board Office, Edmund Street, Birmingham.

COMPETITIONS OPEN.

DATE OF DELIVERY	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug. 23	Clacton-on-Sea—School Board	—	O. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
" 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprava, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	O. H. J. Talmage, Southchurch Road, Warnor Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 16	London, S.E.—Artizans' Dwellings	£100, £60, £40.	F. Ryall, Town Clerk, Bermondsey Town Hall, Spa Road, S.E.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.O. Offices, Tottenham.
" 29	Bideford—Municipal Offices and Public Library	£30, £15, £10.	W. E. Seldon, Town Clerk, 18 The Quay, Bideford.
Oct. 1	Maidenhead—Free Library	£50, £20, £10.	John Kick, Town Clerk, Guildhall, Maidenhead.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.
No date.	Peterborough—Ely—Development of Land	£25.	F. S. Collins, Solicitor, Ross, Herefordshire.
"	Strathcona and S. Africa—Monument in Honour of Canadian Soldiers	—	P. Davidson, London and Lancs Buildings, Montreal, or Bank of Montreal, 22 Abchurch Lane, E.C.
"	Bristol—Reference Library	—	E. J. Taylor, The Council House, Bristol.
"	Grantham—Cottage Home	£5 ss.	Town Clerk, Grantham.
"	Barry—Municipal Buildings	£150, £100, £50.	J. O. Pardoe, District Council Office, Barry.
"	Denby Dale, Huddersfield—Hall and Schools	[Rest. to Local Architects.]	G. W. Moxon, Denby Dale.
"	Glasgow—Sketch Plan of Libraries	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.

New Companies.

G. R. McKenzie & Co., Ltd.

Registered to adopt an agreement between J. W. Sworder and W. J. Perkins of the first part, G. W. McKenzie of the second part, and J. Smyth (for the Company) of the third part, and to carry on the business of house and shop decorators, fitters, and furnishers, carpenters, &c. Capital £12,000 in £5 shares.

Walker's Fire Brick Co., Ltd.

Registered to acquire and carry on the business of brick and firebrick manufacturers lately carried on at Corbridge Station Works, Northumberland, as W. & J. J. Walker. Capital £5,000 in £1 shares. Registered office: 1, Queen Street, Newcastle-on-Tyne.

Messenger Brothers, Ltd.

Registered to adopt an agreement with G. J. Messenger & S. T. Messenger, and to carry on the business of metal workers, builders, public contractors, &c. Capital £12,000 in £1 shares. Registered office: 118, High Street, Hounslow.

Julian Kennedy, Sahlin & Co., Ltd.

Registered to furnish advice, reports, designs, drawings, plans and supervisions in connection with the erection of plant and machinery used in or pertaining to the manufacture of iron, steel and kindred products, and to carry on the business of iron and brass foundries, engineers, &c. Capital £5,000 in £1 shares. Registered office: Duddon Villa, Millon, Cumberland.

Wombwell Parkhills Clayworks, Ltd.

Registered to acquire land and buildings in Yorkshire or elsewhere, and to manufacture

bricks, tiles, &c.; to lay out and prepare land for building purposes, &c. Capital £6,000 in £10 shares.

George Hull, Ltd.

Registered to adopt an agreement with Ann M. Winby, and to carry on the general business of oil and colour men, varnish manufacturers, &c. Capital £5,000 in £1 shares.

East Anglian Engineering Co., Ltd.

Registered to acquire the business carried on at Stowmarket, Suffolk, by the Anglian Engineering Co., Ltd., and to extend the same. Capital £10,000 in £1 shares.

B. W. Pearce & Sons, Ltd.

Registered to carry on the general business of timber merchants, brick and tile makers, as now and hitherto carried on by B. W. Pearce & Sons, and also the business carried on at the Stream Hill Brick, Tile and Pipe Works, and generally to carry on business as timber merchants as carried on by A. S. Barradell. Capital £10,500 in £1 shares. Registered office: Timber Yard, Suradore Road, Cheltenham.

Concordia Electric Wire Co., Ltd.

Registered to acquire and turn to account any patents relating to improvements in the distribution of light, heat, sound, &c. Capital £2,000 in £1 shares.

Dennis Patent Hearth Co., Ltd.

Registered to acquire certain patents relating to improvements in metallic hearth plates, to adopt an agreement with W. L. Dennis, and to carry on business as manufacturers of enamelled panels, curbs, &c. Capital £6,000 in £1 shares. Registered office: 27, Temple Row, Birmingham.

Park Lane (Siddal) Estate Co., Ltd.

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COMING EVENTS.

Wednesday, August 6.

SANITARY INSPECTORS' ASSOCIATION.—Autumn and Provincial Meeting and Conference at Middlesbrough (First Day). Council Meeting in Committee Room, Municipal Buildings, at 6 p.m.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at Middlesbrough (Second Day). Reception by the President and the Mayor of Middlesbrough at 10 p.m. Presidential Address by Sir James Crichton-Browne, M.D., LL.D., F.R.S., at 10.30 a.m. Extraordinary General Meeting at 11 a.m. Mr. T. Pridgen Teale, M.A., F.R.S., on "A Short Sanitary Retrospect." Visit to Saltsburn at 2.30 p.m.

Friday, August 8.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at Middlesbrough (Third Day). Sir James Crichton-Browne on "Malaria: Its Practical Bearing on Sanitation." Mr. George H. Anderson on "A Quarter of a Century's Sanitary Progress in Middlesbrough." Dr. J. Wright Mason, M.O.H., on "Port Sanitary Administration." Dr. Dingle, M.O.H., on "Infectious Diseases," 10 a.m. Garden Party in Albert Park at 2 p.m. Banquet in Town Hall at 6.30 p.m.

Saturday, August 9.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Excursion, Provincial Meeting and Conference at Middlesbrough (Fourth and last Day). Conference resumes at 10 a.m. Excursion by Steamer to Sea at 11 a.m., and visits to Tees Floating Hospital for Infectious Diseases, South Gare Breakwater and Fifth Buoy Lighthouse.

INSTITUTION OF JUNIOR ENGINEERS.—Summer Meeting until August 16th.

Saturday, August 23.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Hartlepool.

TENDERS.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Effingham House, Arundel Street, Strand, W.C.

ASHBY-DE-LA-ZOUCH.—For the erection of five shops and tenement hotel, for Mr. W. Russell, Burton-on-Trent. Mr. F. S. Antill, architect, Draycott, Derby. Quantities by architect:—
Vickers & Son £3,907 0
T. Moss 3,853 0
E. Orton 3,823 0
A. Faulks 3,745 0
H. Vernon 3,739 0
Lowe & Son, Burton-on-Trent 3,604 0
* Accepted.

BALDERTON.—For the erection and completion of an infant school, accommodating 300 children, for the Balderton School Board. Messrs. Saunders & Saunders, architects and civil engineers, Arcade Chambers, Newark-on-Trent:—
T. Barlow, Nottingham £3,878 5 0
C. Saul, Sutton-on-Trent 3,050 0 0
C. Redford, Newark 3,004 17 6
C. Baines, Newark 3,000 0 0
F. Messon, Nottingham 3,003 0 0
F. Ward, Balderton 3,078 0 0
Hockley & Co., Grantham 3,078 0 0
H. Hurst, Newark 3,300 0 0
T. G. Mackenzie & Sons, Newark 3,358 12 4
W. Smith, Newark 3,248 0 0
G. Henderson, Newark 3,228 18 0
G. Brown & Son, Newark 3,187 16 0
F. W. Crossland, Newark 3,144 12 10
[Architect's estimate, £3,150.] * Accepted.

BARROW-IN-FURNESS.—For the erection and completion of additional battery-rooms, &c., at the electricity works, Buccleuch Street, for the Corporation. Mr. H. R. Bennett, borough engineer:—
W. W. Fairbairn £1,184 2 6
W. Gradwell & Co., Ltd. 1,181 8 0
J. Cox 1,135 10 4
W. Saddle 1,125 10 3
T. Brown 1,115 10 0
All of Barrow.

CHADWELL HEATH.—For the erection of farm buildings at the asylum, for the West Ham Town Council. Mr. J. G. Morley, borough engineer:—
Dupont & Co. £8,879 | C. North £9,287
Gregar & Son 6,423 | Works Manager 6,381
H. J. Carter 6,350 | S. Parmenter, Braintree 5,933
* Accepted.

CROYDON.—For works of surface-water drainage in Beddington and Wallington, comprising laying about 5,400 lineal ft. of 12-in., 15-in., and 18-in. pipe sewers, and about 2,707 ft. lineal of 21-in. and 24-in. concrete tube sewer, with manholes, &c., for the Croydon Rural District Council. Mr. Robert M. Chart, F.S.I., surveyor:—
Case Sea Defence Syndicate, Holborn £5,210 0
W. Langridge, Croydon 5,164 13
W. J. Wheeler, Blackfriars Road 4,778 0
Carter & Willis, Clapham 4,728 0
J. & T. Binns, Croydon 4,312 0
Free & Sons, Maidenhead 4,200 0
G. Bell, Tottenham 3,952 0
G. G. Rayner, Croydon 3,903 0
E. Lees, Mitcham 3,313 0

ERITH (KENT).—For the carrying out of private street works, Gordon Road, Stanmore Road, and Ashburnham Road, for the Erith Urban District Council. Mr. A. H. Jennings surveyor:—
T. Adams, Wood Green £2,048 7 10
Lawrence & Thacker, Clapham Common 1,941 1 2
Free & Sons, Maidenhead 1,929 0 0
Wilson, Border & Co., Ilford 1,898 0 5
R. Ballard, Ltd., Child's Hill, N.W. 1,837 7 8
A. H. Wheeler, Blackfriars Road 1,703 11 11
Road Maintenance Co., Gravesend 1,770 8 0
* Accepted. [Surveyor's estimate, £1,814 12s. 1d.]

EPSOM.—For completing the construction of a septic tank and the erection of a pump house, with machinery, at their sewage farm, Hook Road, Epsom, for the Urban District Council. Mr. Edward B. Capon, surveyor, Bromley Hurst:—
Kavanagh & Co., Folworth £1,497
Cropley Bros., Epsom 1,463
Roli & Taylor, Epsom 1,388
* Accepted.

LLANRINDOD WELLS.—For the erection of a vicarage house Llanbedr, Radnorshire, for Rev. J. T. Beynon. Mr. R. Wellings Thomas, architect, Llanrindod Wells. Quantities by the architect:—
R. E. Davies £1,420 0
J. C. Evans 1,379 13
D. Meredith 1,040 10
E. M. Davies, Talgarth 987 0
* Accepted.

LONDON.—For works to offices at the Dalmain Road School, Forest Hill, for the London School Board. Mr. T. J. Bailey, architect:—
Rice & Son £1,437 | F. Bull £1,172
Maxwell Bros., Ltd. 1,421 | H. Leney & Son 1,065
G. Parker 1,290 | J. & C. Bowyer 1,088
J. W. Faulkner & Sons 1,245 | H. & G. Mallett 985
W. Downs 1,220
* Recommended for acceptance.

LONDON.—For the erection of partitions, &c., at the Portman Place School, Mile End Old Town, for the London School Board. Mr. T. J. Bailey, architect:—
F. and F. J. Wood £1,530 0
Bruce, Croom & Co. 1,500 0
W. Martin 1,485 0

London School Furniture Co. 1,450 4
J. Wilmoth & Sons 1,195 0
T. H. Jackson 1,040 0
Turnbull & Sons 969 0
A. J. Sheffield (withdrawn) 948 0
* Recommended for acceptance.

LONDON.—For the erection of school on the Kingsgate Road site, Hampstead, for the London School Board. Mr. T. J. Bailey, architect:—
C. Dearing & Son £20,388 | C. Miskin & Sons £18,000
J. Grover & Son 20,327 | W. Gregar & Son 18,462
McCormack & Sons 19,231 | J. Allen & Sons, Ltd. 18,375
L. H. and R. Roberts 18,828 | J. Simpson & Son 18,070
Treasure & Son 18,610 | E. Lawrence & Sons 17,707
W. Gregar & Son 5,332 | C. Cox 5,178
W. King & Son 5,500 | E. Lawrence & Sons 5,129
* Recommended for acceptance.

LONDON.—For the erection of school on the Globe Street site, Wapping, for the London School Board. Mr. T. J. Bailey, architect:—
J. Grover & Son £9,171 | Stimpson & Co. £5,400
McCormick & Sons 5,872 | J. & M. Patrick 5,380
C. Miskin & Sons 5,574 | J. Outhwaite & Son 5,237
Perry & Co. 5,565 | Treasure & Son 5,228
W. Gregar & Son 5,332 | C. Cox 5,178
W. King & Son 5,500 | E. Lawrence & Sons 5,129
* Recommended for acceptance.

LONDON.—For the erection of cooking and laundry centres in connection with the Berners Street School, for the London School Board. Mr. T. J. Bailey, architect:—
Rice & Son £8,709 | J. Marsland & Sons £7,715
F. & H. F. Higgs 8,400 | E. Lawrence & Sons 7,607
W. Gregar & Son 8,305 | G. E. Wallis & Sons 7,063
J. Greenwood 8,370 | G. Cox 7,000
J. Outhwaite & Son 8,075 | J. & M. Patrick 6,448
Treasure & Son 7,846
* Recommended for acceptance.

LONDON, S.E.—For the erection of additional buildings at the rear of the Town Hall, Walworth Road, S.E., for the Southwark Borough Council. Mr. Arthur Harrison, borough engineer:—
T. R. Tomkins, Camberwell, S.E. £16,911
Marsland & Sons, Walworth, S.E. 14,007
J. Smith & Sons, South Norwood, S.E. 14,405
Gough & Co., Hendon 14,380
W. H. Lorden & Son, Upper Tooting 14,333
J. O. Richardson, Peckham, S.E. 14,050
J. Shillitoe & Son, Bury St. Edmunds 14,000
J. Ham, Camberwell, S.E. 13,384
* Accepted.

LONDON, S.W.—For rebuilding shop and premises, 10 Brompton Road, S.W., for Mr. A. R. Bock. Messrs. Blangy & Van Baars, architects, 12 Southampton Buildings, W.C.:—
Leslie & Co. £2,860 | Adamson & Sons £2,290
Langdale & Hallett 2,700 | F. W. Green 2,283
Stimpson & Co. 2,486 | Syme & Duncan 2,150
Lole & Lightfoot 2,418 | Turtle & Appleton 2,220
* Accepted.

LONDON, S.W.—For the erection of the Southern Hospital, for the Metropolitan Asylums Board. Messrs. Treadwell & Martin, architects:—
F. & F. H. Higgs, Loughborough Junction, S.E. £214,000 0 0
C. Wall, Chelsea, S.W. 201,328 0 0
Rudd & Son, Grantham 201,214 10 7
W. Wallis, Balham, S.W. 201,139 10 0
W. H. Lorden & Son, Upper Tooting, S.W. 198,888 0 0
W. Wilcocks & Co., Wolverhampton 198,873 0 0
Patman & Fotheringham, Ltd., Islington, N. 197,723 0 0

J. & M. Patrick, Wandsworth, S.W. 197,299 0 0
Kirk & Handall, Woolwich 193,203 0 0
J. Shillitoe & Son, Bury St. Edmunds 193,000 0 0
F. G. Minter, Westminster 191,000 0 0
Holliday & Greenwood, Brixton, S.W. 184,444 0 0
McCormick & Sons, Essex Road, N. 179,777 0 0
W. Johnson & Co., Ltd., Wandsworth Common, S.W. 174,750 0 0
* Recommended for acceptance. [Architect's estimate, £207,702.]

LONDON, S.W.—For the execution of certain sanitary work at the Banstead Road School, and for painting and cleaning works at the same school, for the Metropolitan Asylums Board. Messrs. Treadwell & Martin, architects:—

Sanitary Work.
Gardner & Hazell, 84 Canonbury Road, N. £6,136 10 0
W. Rogers, Colchester 6,076 0 0
D. Gibb & Co., West India Road, E. 5,910 0 0
E. Proctor, Plumstead 5,500 0 0
G. Jackson, Sutton 5,462 7 0
G. H. James, Wandsworth Common, S.W. 5,429 2 3
Haslemere Builders, Ltd., Haslemere 5,374 0 0
Staines & Son, 61 Great Eastern Street, E.C. 5,300 0 0
J. Knight & Sons, Chelsea 5,203 0 0
H. Rogers, Sutton 5,200 0 0
J. B. Potter, Sutton 5,127 0 0
A. H. Inns, 36 Camomile Street, E.C. 4,982 15 6
H. Line, 185 Upper Thames Street, E.C. 4,700 0 0
M. Batchelor, Maidstone 4,750 0 0
T. Cole, 125 Offord Road, N. 4,600 17 10
[Surveyor's estimate, £4,600.]

Painting and cleaning Works.
G. Jackson £3,732 17 7
H. Rogers 3,720 0 0
Haslemere Builders, Ltd. 3,492 0 0
Gardner & Hazell 2,763 10 0
G. H. James 2,780 16 8
J. B. Potter 2,706 0 0
J. Knight & Sons 2,600 0 0
Staines & Son 2,380 0 0
D. Gibb & Co. 2,356 0 0
E. Proctor 2,050 0 0
H. Line 2,024 0 0
M. Batchelor 2,008 0 0
A. H. Inns 1,920 7 0
T. Cole 1,904 12 4
W. Rogers 1,785 0 0
P. McCarthy, Fulham, S.W. 1,417 0 0
* Recommended for acceptance. [Surveyor's estimate, £1,900.]

LONDON.—For drainage and sanitary works at the Basnett Road School, Lavender Hill, for the London School Board. Mr. T. J. Bailey, architect:—
J. & M. Patrick £3,907 0 0
Maxwell Bros., Ltd. 2,863 0 0
Martin, Wells & Co., Ltd. 2,700 0 0
D. Gibb & Co. 2,356 0 0
G. Neal 2,523 0 0
Lathey Bros. 2,483 0 0
J. W. Faulkner & Sons 2,437 0 0
Stimpson & Co. 2,380 0 0
J. Carmichael 2,309 10 0
R. P. Beattie 2,355 11 5
L. Whitehead & Co., Ltd. 2,325 0 0
E. Triggs 2,316 10 0
J. & C. Bowyer 2,279 0 0
J. Peattie 2,210 0 0
* Recommended for acceptance.

LONDON, E.—Accepted for the supply, delivery, and erection complete of the constructional steelwork for the new generating station, Canning Town, E.—Ferguson and Co., Engineers, 17 and 19, St. Dunstan's Hill, London, E.C., £3,775.

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TENDERS—cont.

LONDON, N.—For the erection of a house, stables and laying-out garden in Farnham Lane, Hampstead, for Mr. T. Blake Frost, Messrs. Barrett and Driver, architects, 43 Bloomfield Road, Maida Vale. Quantities by Mr. Max Clarke, 4 Queen's Square:—

Miskin & Sons	£7,810 0	Holloway Bros.	£5,560 0
Garrett & Sons	6,196 0	G. Neal	5,549 0
Gough & Co.	5,825 0	Whitehead & Co., Ltd.	5,450 0
Lawrence & Sons	5,721 0	W. Tout	5,293 15
Simpson & Son	5,664 0	Wallis & Sons*	Maid-
G. & I. Waterman	5,644 0	stone.	5,180 0

* Accepted.

Garrett & Sons	£1,384 0	Holloway Bros.	£1,280 0
Miskin & Sons	1,328 0	Whitehead & Co., Ltd.	1,250 0
Gough & Co.	1,316 0	G. Neal	1,312 0
Lawrence & Sons	1,306 0	W. Tout	1,300 12
Simpson & Son	1,300 0	Wallis & Sons*	1,150 0
G. & I. Waterman	1,290 0		

* Accepted.

Garrett & Sons	£1,381 0	W. Tout	£1,058 4
Simpson & Son	1,131 0	G. & I. Waterman	1,045 0
Holloway Bros.	1,120 0	G. Neal	1,040 0
Whitehead & Co., Ltd.	1,100 0	Gough & Co.	983 0
Lawrence & Sons	1,075 0	Wallis & Sons*	945 0
Miskin & Sons	1,060 0		

LONDON, N.—For the erection of two houses on the site of the old "Vale of Health" Tavern, Hampstead Heath. Messrs. Lowe and Goldschmidt, Heath Street, Hampstead, and A. W. Hudson, 87 Finsbury Pavement, E.C., architects:—

J. & W. T. Inkpen	£2,169 0	Dabbs & Son	£1,480 0
W. J. King	1,936 10	A. Collins	1,175 0
Sheffield Bros.	1,797 0		

LONDON.—For improvements at the Popham Road School, Islington, for the London School Board. Mr. T. J. Bailey, architect:—

W. Gregar & Son	£8,250	J. Appleby	£7,022
Clarke & Bracey	8,232	E. Lawrance & Sons	7,508
J. Simpson & Son	7,923	McCormick & Sons	7,332
W. M. Dabbs	7,882	General Builders, Ltd.	7,130
E. Triggs	7,717	Treasure & Son	6,816
C. Cox	7,713	G. S. S. Williams & Son	6,709
J. Grover & Son	7,642	C. Dearing & Son*	6,633

* Recommended for acceptance.

LONDON.—For the erection of a special school for mentally defective children in connection with the Chaucer School, Tabard Street, Borough, for the London School Board. Mr. T. J. Bailey, architect:—

E. P. Bull & Co.	£8,271	J. Greenwood	£2,046
Holliday & Greenwood, Ltd.	3,262	T. D. Leng	2,800
F. & F. H. Higgs	3,197	E. Triggs	2,867
W. Downs	3,099	J. Marsland & Son	2,812
J. Appleby	3,096	W. Johnson & Co., Ltd.	2,790
Treasure & Son	3,045	Thomas & Edge	2,733
Johnson & Co.	2,993	Turnbull & Son*	2,620

* Recommended for acceptance.

LONDON.—For supply and fixing of laundry machinery and plant at the Joyce Green Hospital, for the Metropolitan Asylums Board. Messrs. Treadwell & Martin, architects:—

Manlove, Alliott & Co., Ltd., Gracechurch Street, E.C.	£9,390 11 0
Wenhams & Waters, Ltd., Croydon	8,253 0 0
H. H. Joel & Co. and T. Potter & Sons, United, Ltd., 44 South Moulton Street, W.	8,172 0 0
T. Bradford & Co., High Holborn, W.C.	8,150 0 0
Lees & Harrison, Ltd., Leeds	8,000 0 0
J. & P. May, Lincoln's Inn Fields, W.C.	7,997 0 0
Entwistle & Gass,* Bolton	7,397 2 8

* Recommended for acceptance. [Engineer's estimate, £7,800.]

LYMINGTON.—For the erection of a house for Mr. T. J. D. Rawlins, Mr. Alfred C. Bothams, architect, 32 Chipper Lane, Salisbury. F. Reeks ... £1,891 | S. Elgar & Sons ... £1,808
Jenkins & Sons ... 1,821 | H. Preston* ... 1,770
* Accepted.

OLDLANDS COMMON (BRISTOL).—For proposed additions to Victoria Factory, for Messrs. C. Bayer & Co., 31 London Wall, London. Mr. Fred. Gardiner, architect, Bath:—

W. Church, Bristol	£2,096
Erwood & Morris, Bath	2,879
Howard & Sons, Bath	2,875
Wills & Sons, Bath	2,849
A. J. Beaven, Bristol	2,800
Hayward & Wooster, Bath	2,443
Chancellor & Sons, Bath	2,397
W. Webb, Bath	2,332
Adams & Jefferies,* Bristol	2,295

* Accepted.

WHITBY.—Accepted for the erection of a pair semi-detached houses, Prospect Hill, Whitby, for Captain J. A. Page. Mr. Edward H. Smales, architect, Whitby:—

Coverdale & Longhorn, brickwork, mason, slating, plastering, carpenter and joiner	£1,092 10 0
E. Smithson, plumbing, glazing, and smith	130 18 0
Burdon, Flowergate, painting	20 10 0

WIGAN.—For proposed alterations and additions to the Wesleyan Church, Standishgate, Wigan. Messrs. J. B. & W. Thornley, architects, Library Street, Wigan:—

Rathbone, Leigh	£3,874
Winnard & Son, Wigan	3,419
Wood & Son, Bolton	3,312
Hirst & Son, Wigan	3,290
D. A. Ablett, Wigan	3,270
Wilson & Co., Wigan	3,140
J. Johnson & Son,* Wigan	3,093

* Accepted.



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In addition to the above complete List of Sections, there will be a number of Special Articles, fully illustrated, dealing with matters of general interest to the Profession.

To Subscribers.

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Advertisements will be placed, as far as possible, in the Trade Section, and opposite the particular matter to which they relate.

Trade and Craft.

A New Pipe Joint

A new joint for sanitary and water pipes has been invented by Mr. E. G. Wright, F.S.Sc., ventilating and sanitary engineer, of Guildford, Surrey, late of Portsmouth, the inventor of Wright's patent twentieth-century ring cowl and ventilator. The joint is formed by a ring of compressed and treated cork inserted in the socket of the pipe. This compressed cork ring fits tightly on to the pipe, requiring some force to push it home, but any little inequality is filled up by the compressed cork swelling with the water that gets through until tight up against the pipe. The cork is sufficiently flexible to give slightly where required. The advantages of such a joint are apparent. Fitting tightly in the socket and on to the spigot, a true centre is secured, and only unskilled labour is required for laying. Several pipes can be joined together on the surface, and lowered into the trench and forced home by levering one end with a crowbar. Furthermore, the pipes can be taken apart without destroying the joint, which can be used again. Thus they could be laid for temporary purposes, such as for carrying water in camps. The cost of these joints is small, one for a 4in. pipe costing about 6d. Mr. Wright claims for his joint the following advantages over the various composition joints:—(1) Considerably less cost, (2) can be laid in damp places and under water (joints made with bitumen compositions are notably defective in such cases, for the composition, which has to be applied hot, will not adhere to damp surfaces), (3) true centres, (4) laid with unskilled labour, (5) joints can be broken and used again, (6) the joint is applicable to metal

pipes, (7) can also be used for a flushing pipe joint, and for the blind seating of a pedestal or other pan closet, doing away with lead caulking, (8) can be used for all kinds of electric conduits, and (9) from 12 to 20 pipes can easily be laid in an hour. The cork rings can be made of any size and shape. The pipes are different to those ordinarily used, being made without a key in the socket or on the spigot, because if there were the cork would swell into the crevices and tear when the pipes were pulled apart. They also have on the spigot end of the pipe a ridge or band formed so as to make absolutely certain that the end of the spigot is dead on the base of the collar, also preventing corrosion. The composition cork is stated by Mr. Wright to be lasting, and not harmed by sewage or water, and not to decay, and if this is so the joints should be very extensively adopted. The outside or exposed face of the cork joint is preserved with a coating of waterproof bitumen cement. Mr. Wright supplies pipes with the joints already placed in them; the advantage of having the pipes and joints complete ready for laying straight from the works is obvious.

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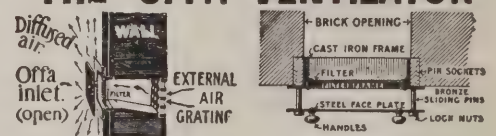
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An Architectural Causerie.

Architectural Lies. As an illustration of the popular view of architecture it would be difficult to find a better example than the annexe built on to Westminster Abbey for the purposes of the Coronation ceremony. This wonderful sham is doubtless familiar to most readers by this time, but for those who have not seen it we may explain that it projects from the west end of the Abbey below the two great towers, a one-storey building, battlemented, weather-stained, worn and ancient-looking, with stained-glass windows having rusty bars, and sundry statues in niches on its front. In the course of his recent speech in the House of Commons on the new Government buildings Lord Balcarras incidentally congratulated Mr. Akers-Douglas on the "remarkable forgery" in question, but he rather missed his point by saying that it was a pity the annexe had been built by an Italian, because it was designed by a gentleman on the permanent staff of the Office of Works (Mr. Nutt) and carried out in lath and plaster by Messrs. Mowlem & Co. However, the point which we specially wish to refer to concerns the popular impression of this building. Nine out of ten persons consider it to be very fine—a grand old specimen of architecture forsooth: and these persons strongly resent the suggestion that the annexe, instead of mimicking the old, should have looked what it is—a temporary building. These persons willingly admit that lying is not an estimable quality, but they cannot see that this is equally applicable to architecture as it is to individuals. There are all sorts of lies to be found in modern architecture—mostly what might be termed "white lies"—but when one comes to a downright forgery like the Abbey annexe there can be nothing but absolute censure for it. We can certainly admire the skilful way in which it has been carried out, just as one would a forged bank-note or a clever theft, but the motives which prompted its erection are indefensible. It may look exactly like a genuine ancient building, but the knowledge that it is not what it looks should condemn it. It would be quite possible to copy the Pyramids in cast-iron—great hollow creations—or the gigantic sitting figures of Thebes: but, though the outward resemblance was exact in every detail, we should never admire them like the originals. It is the history wrapt up in ancient buildings that constitutes their greatest charm, apart, of course, from questions of design, which are not now under consideration. If one could conceive persons so satisfied with the seeming appearance of things that empty cast-iron pyramids satisfied their every desire, then we might reasonably agree to any forgery which an Office

of Works could devise; but till then we can only feel that their efforts have been sadly wasted and, indeed, have been harmful to the general public by teaching them that a lie in architecture is as good as the truth, provided it is told with sufficient adroitness and ingenuity.

The Strand Bridge.

SIR JOHN WOLFE BARRY is ever ready with some scheme for relieving the congestion of traffic in London streets. He has made many suggestions from time to time, some of them of gigantic nature (such as that for forming a great east to west thoroughfare at a cost of five millions sterling). He now proposes that a bridge should be erected across the Strand at Wellington Street, so that the one stream of traffic might cross over the other and thus avoid

the latter bridge, in order to get on to the Strand bridge, would have to cross in front of that going in the opposite direction; and it must not be forgotten that though a vast number of carts and wagons go to or come from Covent Garden there is still a great deal of traffic that turns into the Strand. So that, in its present state, we are rather inclined to scout the scheme. Moreover, a widening of Waterloo Bridge would seem imperative. The congestion of traffic in London is apparent, and as the number of vehicles increases every year some method of relief must be found. If this can only be done with a bridge across the Strand it is useless to raise a cry of "desecration." The traffic problem has to be solved somehow; and provided the bridge were treated satisfactorily—preferably by an architect and engineer



COTTAGE AT CARLTON, SELBY, ON THE ESTATE OF BARONESS BEAUMONT.
THE LATE J. F. BENTLEY, ARCHITECT.

[Photo: E. Dockree.]

the present congestion and delay. The suggestion is being considered by the Works Committee of the Westminster City Council, and though the scheme is merely in outline at present one is able to state that the bridge or viaduct would commence at the corner of Tavistock Street (which comes into Wellington Street above the Lyceum Theatre), and after crossing the Strand would descend and turn out on to Waterloo Bridge just where the office of the Duchy of Lancaster now stands—that is, at the beginning of the bridge proper. It is here, however, that the main difficulty would occur, owing to the meeting of the two streams of traffic, for the stream passing over the Strand bridge would meet that coming over Waterloo Bridge. If the bridge were on the Somerset House side the downgoing traffic would join that going across Waterloo Bridge in the same direction; but the traffic coming over

in collaboration—it would add rather than detract from the appearance of the Strand. The Ludgate Hill bridge is certainly an eyesore, but there is no need to follow that wretched model. Street proposed to put a bridge across from his law courts to the Temple. The idea was never carried out, but if it had the thoroughfare would have been given an additional feature of interest.

A Cottage by Bentley.

THE cottage at Carlton, Selby, illustrated on this page, shows how characteristic are the marks of a man of genius, for even in such a humble dwelling as this, with little opportunity for display, we see a resemblance to that grander work which Mr. Bentley produced for other purposes. It is a common weakness with men of small talent that they attempt to excuse their faults by pleading lack of opportunity; a cottage like this shows the feebleness of such a plea.

ALL SAINTS', EAST MEON.

By J. RUSSELL LARKBY.

TO those who care to see Norman architecture in a village church shown to its advantage, a pilgrimage to East Meon will well repay them for the rather bad roads leading to the place. The site of the church is peculiar, lying as it does at the foot of a sharp hill of uncultivated ground. Structurally the church consists of a chancel, south Lady Chapel, north and south transepts, nave, south porch, and a noble central tower, thus presenting an interesting example of a country church complete in nearly all its constructional parts.

The earliest portions of the church are the crossing, tower transepts, and the north and west walls of the nave.

On the north wall of the chancel is placed the Lady Chapel, opening to the sacarium by two extremely good arches of the thirteenth century supported by circular columns of great strength (Fig. 1). This work, notwithstanding its great bulk, is Early English, and is probably the attempt of the thirteenth-century architect to harmonize his work with the Norman architecture which it adjoins. Entering the chapel by the western entrance through the south transept, one is struck by the excellent proportions of this part of the church. The noble stature of the thirteenth-century columns and arches leading into the sacarium is most effective. The lights of the chapel are all Perpendicular insertions, so that at first sight it appears to be wholly a fifteenth-century addition. There is no evidence of a piscina, and careful wall tapping failed to yield any indication of one.

As before stated, the Norman work of the building remains chiefly in the crossing. Of this the nave arch is illustrated at Fig. 2. It represents Norman work certainly good of its kind, but not at all uncommon; the companion capitals of the chancel arch are of similar character. The bases are simple, consisting of a hollow between two rounds, the whole mounted on a boldly projecting plinth.

Some considerable difference in treatment is apparent in the transept arches (Fig. 3). Here the work is as plain as possible, though boldly

effective; the tooling on the ashlar is in long coarse lines, slightly curved, forming an excellent specimen of axe working. On the eastern responds of both transept arches there is some evidence of colour-work in which portions of cusped arches can be traced.

In the south transept a window with a triangular head gives, at a distance, a promise of Saxon work; it is, however, altogether deceptive, dating only from the earlier part of the fifteenth century, and is merely an attempt of the time to vary the use of the depressed (and depressing) arch in windows.

Access is gained to the Lady Chapel through a thirteenth-century door in the east wall of the transept, and near it a somewhat similar opening may have served as a squint. Above it is a Norman light, which before the erection of the Lady Chapel was an outside opening. From this it seems that the Norman church was not provided with a separate enclosure for the Altar of Our Lady, and we may perhaps look upon the north transept as its site previous to the thirteenth century. In the west wall of the south transept is a second Norman window now

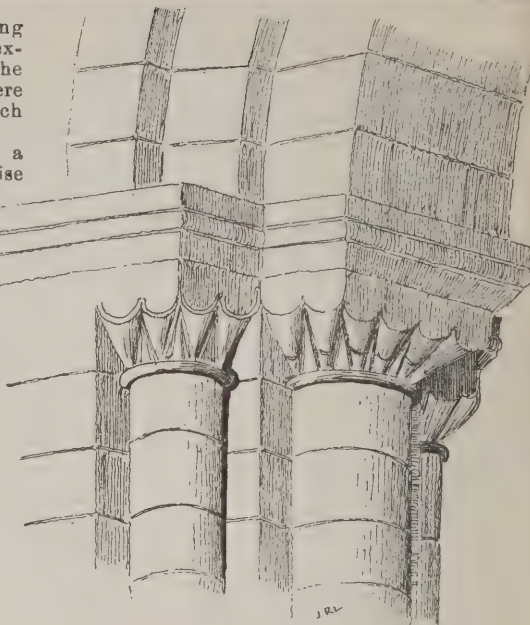


FIG. 2.—ARCHES OF NAVE, EAST MEON.

At the western end of the nave (also the western termination of the Norman church) is the elaborate doorway shown at Fig. 6 (p. 413), doubly recessed, and altogether a good example of the sturdy Norman architecture.

On the north wall of the nave is the greatest expanse of Norman work, although even here the new lights were inserted during the fifteenth century.

The appearance of the church at various periods of its architectural history may be summed up as follows:—

Norman.—The grand central tower (probably without a spire), the present transepts, a square chancel and an aisleless nave; the windows, small for the size of the building, and single throughout, with the possible exception of the east light.

Early English.—The chancel lights were altered during this period, and a new east window was inserted, of which only the present interior shafts remain *in situ*. At this time too an important structural alteration was made by the addition of a Lady Chapel, thus destroying the symmetry of the Norman church. The position of this chapel on the south side of the sacarium is somewhat unusual, but a reason is not far to seek. The steep hill at the back of the building presents a somewhat difficult site for the erection of a building suited to the ideas of the thirteenth-century architect.

Decorated.—The nave, enlarged by the addition of a south aisle and the consequent removal of the south Norman door to its present position. Other minor details consisted of the construction of the curious half bay* from the transept to the aisle, and perhaps the paintings on the respond of the transept arches.

Perpendicular.—The windows of the Lady Chapel and others in the nave and transepts. It should be noticed that the floor level of the north transept is higher than that of the south, a result occasioned by the structural alterations made in the south side of the church during the fifteenth century.

On the floor of the south transept is a small slab bearing the mysterious inscription "Amens plenty." The "a" in "Amens" seems to be an addition, but beyond suggesting that the stone is of Puritan origin I can say nothing. The style of writing certainly seems to indicate a date in the sixteenth century. It was pointed out to me by a villager who, although allowing some praise for the font, could see nothing but this insignificant piece of stone in the south transept.

On the exterior of the chancel wall a vertical joint in the masonry indicates the south-east angle of the Norman chancel prior to the erection of the eighteenth-century Lady Chapel.

* Some similar half-arches (also interruptions in the original design) exist in the choir of the Abbey Church, Iona.

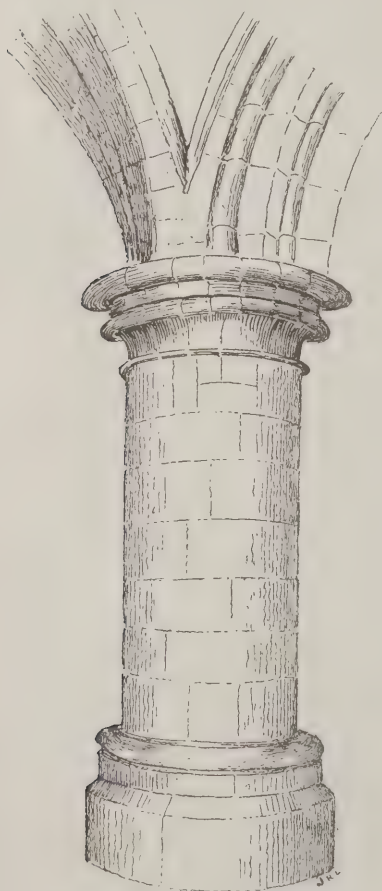


FIG. 1.—EARLY ENGLISH WORK, LADY CHAPEL, EAST MEON.



FIG. 3.—TRANSEPT ARCH, EAST MEON.

only communicating with the added south aisle erected during the fourteenth century. The curious method of connecting this aisle with the transept is shown at Fig. 4. It is distinctly uncommon, and in its way effective. The work is square, and, as much of the material is very roughly treated, it is possible that some of the old stones from the south wall were used in its construction.

The division between the south aisle and its Norman nave is made by three Decorated arches mounted on octagonal piers; the capitals and some of the arch stones show signs of colour seemingly freely used in the church during the fifteenth century. At the west end of the aisle stands the magnificent Norman font, but reference to this will be made when the purely constructional features of the church have been pointed out. The Norman doorway (Fig. 5) in the south wall is also fine, and originally stood on the line of the south arcade until structural alterations necessitated its removal.

This is interesting, as with the flat Norman buttress it proves that the chancel has not been extended, and that the present sanctuary wall may be looked upon as wholly twelfth-century work.

A second vertical joint in the west wall of the nave similarly shows the extent of the building before the northern extension in the fourteenth century.

The exterior of the central Norman tower (Fig. 7) is undoubtedly fine, binding the whole structure into one harmonious whole. The triple windows are deeply recessed, and in the light of the setting sun the effect is beautiful in its sturdy way. The lower stage of the tower is quite devoid of ornament, all detail being suppressed in order to gain greater effect for the upper stage. Here we have a legitimate piece of architectural ornament linked with intelligent use, and as such the Norman tower at East Meon must rank high with the works

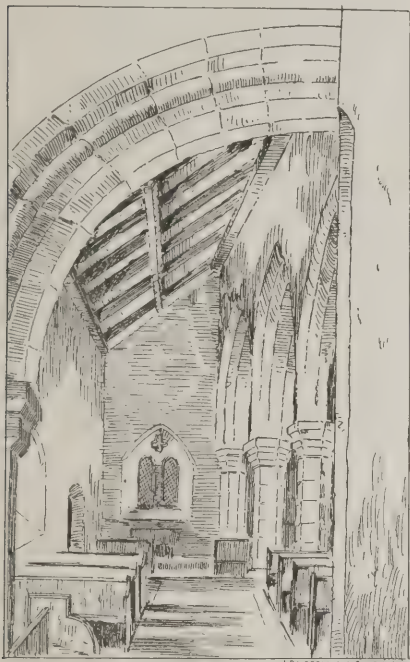


FIG. 4.—SOUTH AISLE EAST MEON.

of any period. The appearance of the tower is sadly marred by the spire, which, to tell the truth, is altogether wretched. A Norman tower depends entirely on solidity for effect, but the builders of the spire knew a great deal more about the matter than the original architect and they therefore erected this spire without even a remote appreciation of propriety. As a natural result, the eye is carried upward and quite away from the actual decorative feature of the tower; the unornamented windows of its second stage take, as it were, a secondary place in the architectural scheme.

In the ringing stage of the tower a small board fastened to the north wall mentions that the "saints' bell" "should be rung for 2 minutes." The board is of seventeenth-century date, and the ringing of the saints' bell thereon mentioned refers to matins and not to the proper place during mass. The use of the name, however, is interesting as showing its revival long after the bell had been alienated from its rightful use. In some old notes on the church kindly lent me by the vicar it is stated that the saints' bell hangs "in one of the windows" (of the sanctuary?); this was prior to the restoration, and after that catastrophe it was not forthcoming. It is now supposed to be doing duty as a school bell in Southampton.

The Norman font standing at the west end of the south aisle must rank high outside its local limit as a specimen of twelfth-century carving; its interest is intense, and its panels furnish us with a delightfully quaint rendering of the Creation and Fall of Man. The story begins in the north face (Fig. 8) with the creation of Adam and Eve and the eating of the Forbidden Fruit. It is most interesting to notice that in the Tree, where by the nature of

the subject foliage is absolutely necessary, the Norman artist was obviously reluctant to more than suggest in a very sketchy manner the idea of leaves and fruit. The serpent clinging to the Tree has an extremely pronounced head, and seems to be suggesting to Eve the idea of the Sin of Disobedience. On the east face the completion of the Fall is depicted (Fig. 9); the angel with a flaming sword—which, by the way, is very Norman—is seen thrusting Adam away from the Gate. To the artist the entrance to the Garden of Eden was an idealised Norman structure, but we must forgive him the quaint inaccuracy for the delightful humour of it. The other figures represent the labours of the fallen, with Adam seemingly undergoing a course of instruction in digging.

The other faces of this interesting font bear a reading which has no great interest (Fig. 9A). On the upper surface of the bowl there is an intricate design (Fig. 10) carved mainly with the idea of filling up space. As ornament simply, it is interesting, but it lacks the force of the figures on the sides. On plan, the lower portion of the font has but little of note, as, owing to centuries of wear, little of the detail is left. The disengaged shafts seem to be insertions, as they do not fit the capitals attached to the bottom of the bowl.

I have heard this font referred to as being of foreign origin. It seems to be the custom to follow this plan with regard to almost any really good work in village churches. After a very close examination of this beautiful example I quite fail to see why it should be called a Continental work. There is nothing either in the shape, foliage or treatment to betray foreign workmanship; and although the material may not be English I cannot see that it necessarily follows that the carving is also alien. Foreign stone is often used at the present time in fonts and chancels, yet no one thinks of attributing the actual work to a foreign agency; foreigners certainly would not take much credit from us if some of our modern works were attributed to them!

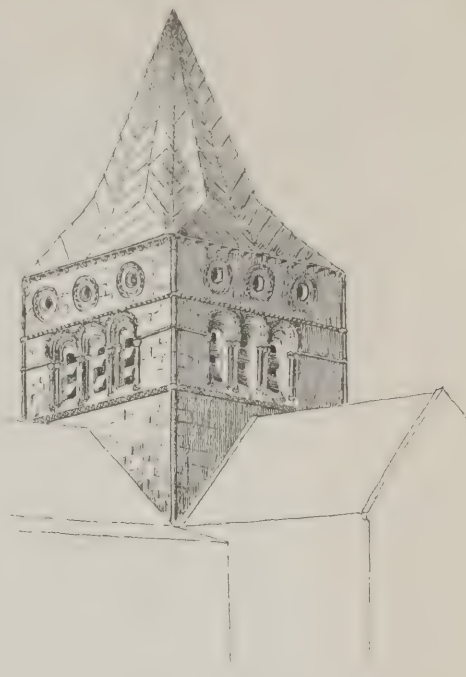


FIG. 7.—CENTRAL TOWER, EAST MEON.

Manchester Infirmary Rebuilding: Plans Rejected.—The result of the voting of the trustees of the Manchester Royal Infirmary as to whether the proposals of the Board of Management for the rebuilding of the infirmary on its present site in Piccadilly should be accepted was made known last week. The trustees have rejected the plans of Messrs. Simpson & Allen, prepared by the orders of the Board.



FIG. 8.—NORTH FACE OF FONT.



FIG. 9.—EAST FACE OF FONT.

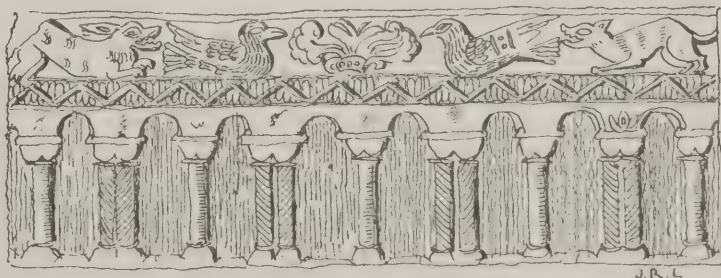


FIG. 9A.—SOUTH FACE OF FONT.

ARCHITECTURAL EDUCATION IN LIVERPOOL.

The Courses at University College.

WE have received a copy of the syllabus for next session of the architectural classes held at University College, Liverpool (Roscoe Professor of Art, Mr. F. M. Simpson, F.R.I.B.A.; demonstrator and assistant lecturer, Mr. B. M. Ward). The autumn term begins on October 2nd and terminates on December 19th; the Lent term from January 5th to March 21st; and the summer term from April 22nd to July 4th: evening classes commencing on October 15th.

There are two courses open to students:—(a) The *three years'* course leading to the degree of B.A., with Honours in Architecture. (b) The *two years'* course, at the end of which the college certificate is granted to successful students. These courses are arranged for students to take *before* entering an architect's office. They are not intended to supersede pupilage, but to be preparatory to it. The two years' course has been in existence for eight years; the degree scheme was only started last session. (University College, Liverpool, is the only college in England in which students can study for such a degree, although such courses exist in all the principal universities in America.)

The leading architects of Liverpool have signified their hearty approval of the schemes, and have agreed to shorten the term of pupilage and reduce the ordinary premium for students who have been awarded the college certificate or have taken their degree. The two courses are framed to prevent the waste of time which invariably results when a student enters an office without any previous knowledge of drawing, building construction, and the elements of architectural design. Students entering in October will have the exceptional advantage of being able to follow, from commencement to finish, the erection of the new laboratories for



FIG. 10.—TOP OF FONT BOWL, EAST MEON.

physics and tropical medicine which are being built on college ground from designs by Messrs. Willink & Thicknesse and Professor Simpson.

Candidates for the B.A. degree are required to pass:—(a) The preliminary examination of the university in five subjects: (1) English language and English history (2) mathematics, (3) Latin, (4) elementary mechanics, (5) one of the following—Greek, German, French. (b) The intermediate examination for the ordinary B.A. degree in the following subjects: (1) One of the following—Greek, Latin, French, German, Italian; (2) one of the following—ancient history, modern history, English literature; (3) one of the following—physics, pure mathe-

matics, applied mathematics. Candidates are required to present certificates of having attended (a) the approved classes for the subjects presented in the Intermediate examination; (b) courses of instruction in architecture and allied subjects averaging not less than five hours a week in the first year and fifteen hours a week in the second and third years. Such courses shall include all the subjects presented for examination. An attendance of not less than fifty hours in the department of engineering is required from all candidates.

The subjects of examination are:—(a) History of ancient and mediæval architecture; (b) history of modern architecture; (c) construction and planning of buildings, including sanitation; graphic statics; (d) architectural drawing. And any two of the following:—(e) Freehand drawing; (f) modelling; (g) decorative design; (h) applied mechanics; (i) art and theory of painting; (j) art and theory of sculpture.

Students are strongly advised not to commence the three years' course until they have passed the Preliminary examination. Although it is possible for a student to be privately coached for the subjects of this examination during his first year, passing his Intermediate at the end of the second, such a course is not advisable, nor is it recommended.

The two years' course includes freehand and architectural drawing, construction and building materials, the history of ancient, mediæval and Renaissance architecture, perspective and sciography, graphic statics, engineering, &c.

Students who receive a first class certificate at the end of the course are specially exempted from the Intermediate examination of the Royal Institute of British Architects. This is the first college or institution in England to whom this privilege has been accorded. Five students have been exempted this year.

Students and assistants already engaged in offices, and others, can join any of the lectures and classes which form part of the regular curriculum. The Advanced Design Class has been in existence for four years, and each year about twenty students have joined. If the class however were better known this number would probably be greatly increased. The advantages to a student of making designs for different kinds of buildings, and of seeing the designs submitted by other students, are generally admitted. The Elementary Design Class is a new class which will be started next session, in order to afford an opportunity to less advanced students of working out simple problems in design. The fees for these two classes are purposely made almost nominal.

The composition fee for the complete curriculum is £25 for a session of three terms. This admits to all lectures by the professor of architecture or his demonstrator, to the architectural studio whenever open, to the other lectures and classes mentioned in the time table, and in the case of students taking the degree course to the necessary lectures for the Intermediate examination. Students who do not pass their Preliminary examination before commencing the course are required to pay an extra £5 in their second year. These courses provide for about thirty hours a week each session, and students can also work in the studio in the evenings.

Visits will be arranged from time to time to places and buildings of interest, old and new. Arrangements can be made enabling students to work in the Applied Art School during the Easter vacation, and during the long vacation they are advised to enter a builder's shop and to work with the tools on masons', joiners' and plumbers' work, &c., to join the summer vacation class in the engineering workshop, or to spend the time in sketching and studying old work or in working out special exercises.

At the Church of St. Barnabas, Gillingham, Kent, a reredos has been erected to the memory of the Rev. Cyrus Steel. The design is of Gothic character, of the period of the thirteenth century, the material being principally Caen stone and Irish marble. The cost was nearly £500.

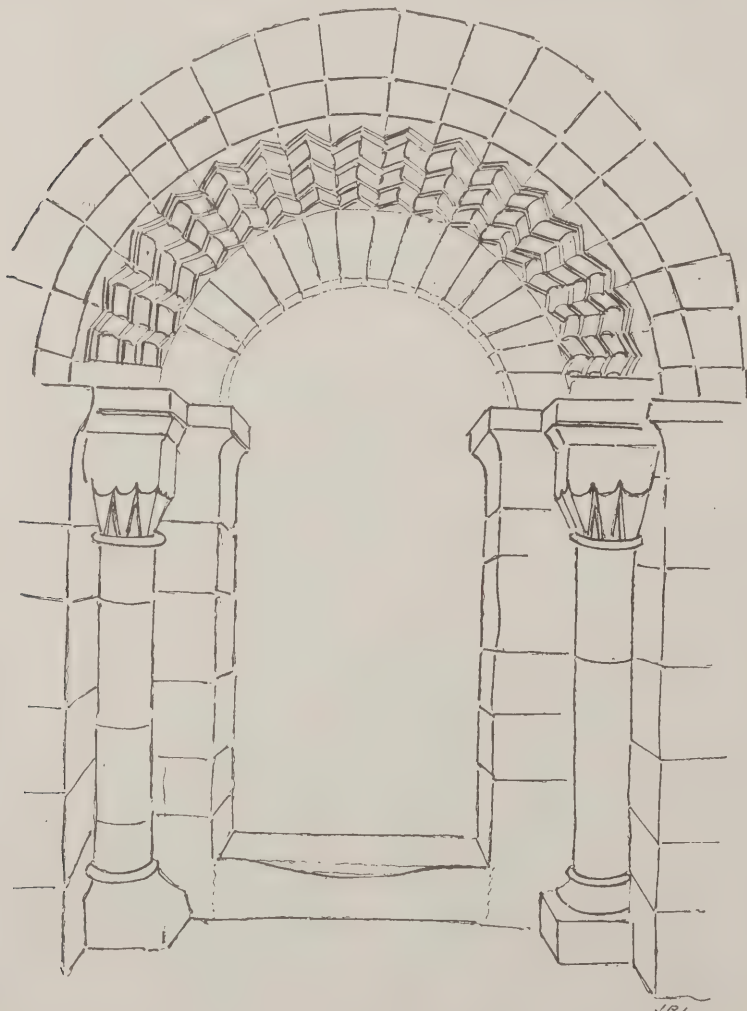


FIG. 5.—SOUTH PORCH, EAST MEON.

Views & Reviews.

The French Stonehenge.

About half-way between Brest and Nantes are found numerous lines of great stones which form the subject of this monograph. These stones are of various sizes up to 20ft. high and are disposed generally from west to east, so that it is supposed the pre-Celtic race by whom they were erected were sun-worshippers. Starting from Auray (the nearest station) we come upon some of the cromlechs and menhirs (single stones which, when arranged in circles, are called cromlechs), then the dolmens of Mané Kerioned (dolmens consist of one flat stone supported by uprights), and then on the great "Alignments of Carnac." These last consists of long rows of single stones extending in some cases for 4,000ft., and called "The Place of Stones" (those known as "Le Ménéec"), "The Place of the Dead" (those of Kermario) and "The Place of Burning" (those of Kerlescant). There are altogether ten principal alignments terminating in cromlechs—at Kerlescant there are 579 stones in the lines and 39 in the cromlech; at Kermario 989 stones in ten lines; and 1,169 in the alignments of Mézec. It is not absolutely certain for what purpose these stones were erected, but the author is strongly inclined to favour the theory that they were first monumental places among a pre-Celtic race, being used later, from time to time, for assemblies of a religious or possibly political nature; that they were used and adapted by the Romans in many instances for shelter and residence; and that they were utilised subsequently by the peasantry for the same purpose.

The book is a reprint from the Journal of the British Archaeological Association, with numerous additions and illustrations.

"The French Stonehenge," by T. Cato Worsfold, F.R.H.S., F.R.S.L. London: Hemrose & Sons, Ltd., 4, Snow Hill. Price 5s.

Architectural Drawing.

A new and revised edition of Mr. R. Phené Spiers's well-known book on Architectural Drawing has just been issued by Messrs. Cassell & Co., Ltd. The text has been carefully revised, and additions and alterations have been made to bring it up to date. There are also some changes in the plates, four of the tinted examples being omitted and seven new plates substituted, one of which, a study of the superimposed orders, made in Paris by the author, suggested the value of including in the text some description of the curriculum of study followed by the Ecole des Beaux-Arts. Two of the new plates are reproductions of drawings by the late W. Eden Nesfield in the collection of the Royal Institute of British Architects. Other drawings by Viollet-le-Duc have been lent to the author by the Rev. G. H. West, D.D. A noticeable addition is a pen and ink drawing by Mr. J. B. Fulton in the style so popular just now in the competition work for the Institute. This is by no means one of Mr. Fulton's best drawings and is not a good example for the student to follow. It has a somewhat decorative feeling, but is untruthful, incoherent, and does not give that sense of repose and ease always belonging to the best work. The receding planes of the picture, too, are badly rendered, or rather not rendered at all, the eye being left to laboriously trace distance by the outlined forms.

The book is now so well known that it is not necessary to deal with the original matter of the volume. Suffice it to say that it is the best published upon this very important branch of an architect's training. The section devoted to working drawings is as bald as formerly, and the examples reproduced in colour are by no means models, neither in drawing, design, details, nor colouring. A working drawing need not be coloured with hot crude tints, so as to be an offence to the eye, although this is usual, and we expect from a book which sets itself up as a guide that the best examples should only be given. We note that such men as Messrs. T. M. Rooke, C. E. Mallows, Geoffry Lucas, Joseph Pennell, F. L. Griggs, A. N. Prentice and H. Wilson are still not represented. The description of the curriculum of the Ecole des Beaux-Arts is interesting, as showing the great stress that is there laid upon the study of the Classic Orders, and no better

example could be given of its advantage in the training of eye and hand than the admirable drawing by Mr. R. Phené Spiers which forms a frontispiece to the book. There can be no harm to the student in such studies, and the objections that the methods of the Ecole des Beaux-Arts tend to repress originality do not rest upon this.

"Architectural Drawing" by R. Phené Spiers, F.R.A., F.R.I.B.A., Master of the Architectural School of the Royal Academy. New edition: Price 7s. 6d. nett. London: Cassell & Co., Ltd., La Belle Sauvage Yard, Ludgate Hill, E.O.

THE NEW NOTTINGHAM ASYLUM.

THE new county lunatic asylum near Nottingham has now been opened. The building has involved so far an expenditure of about £140,000, including the site, which comprises an area of 134 acres and was purchased from the trustees of Lord Newark for £6,880. Of this, 22 acres are absorbed in the building, gardens

Fish & Sons, of Nottingham. The decoration has been carried out by Messrs. W. G. Simms & Son, of Nottingham. Mr. J. J. Bird was clerk of the works. When the asylum is fully completed, to give accommodation for 600 beds, it is anticipated that the total expenditure will amount to £154,800, which will be at the rate of about £258 per bed.

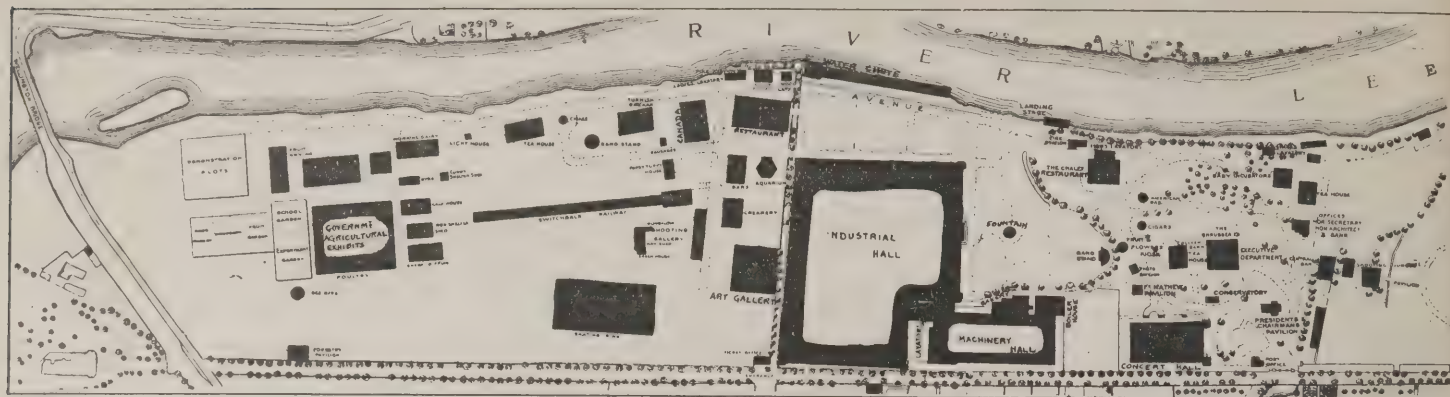
The main entrance is on the Cropwell Road, which skirts the site on the eastern side where are two pairs of cottage villas for the chief engineer, head attendant and other minor officials. On the north is the main entrance block, containing the chief offices and visiting rooms, through which access is obtained to the main corridors communicating with both wings of the asylum. The blocks for patients are on the east and west sides respectively, the males being accommodated on the former and the females on the latter, and contiguous to these are the electrical-generating station, workshops, bakery, laundry, sewing-room, &c. The general administrative buildings form the central portion



FIG. 6.—WEST DOOR, EAST MEON.

and recreation grounds for the patients. The kitchen gardens will cover another 10 acres, and the remainder of the farm is laid down with grass, the intention being to produce the milk for the whole of the patients. The site is situated off the main road to Grantham about a mile beyond Radcliffe and seven from Nottingham, and has an elevated position, and in that respect, as well as its contiguity to the city and its accessibility from all parts of the county, is admirably adapted for its purpose. In fact, it was regarded as the best of seven sites that were originally selected, some of which, while suitable in other respects, did not offer the advantage of a central position. The building, which is mainly of brick, was designed by Messrs. E. P. Hooley & J. Sander, engineers and architects, of Nottingham. The work has been in progress three years, and it is satisfactory to note that throughout the whole operations no serious labour trouble occurred, neither was the work interfered with by adverse weather. The general contractors for the superstructure were Messrs. Pattinson & Sons, of Ruskington, near Sleaford, and the foundation contractors were Messrs. T.

of the institution, and in addition to the general stores and kitchen department there is a spacious and almost handsome recreation hall capable of accommodating 600 patients, and provided with dressing-rooms, as well as a stage completely equipped for theatrical and musical entertainments. There is a chapel in the Early Gothic style at some distance from the main block. It is of brick construction with stone dressings and tiled roof. The interior is finished with simple plastered walls and pitch-pine roof, the floor being laid with maple blocks. The seats, which will accommodate about 400 persons, are also made of pitch-pine, the pulpit, reading desk and other special fittings being of polished oak. The attendants are provided with quarters on each side of the administrative block, while the dispensary and the necessary provision for the housekeeper and servants are on the south side of the recreation hall, and are in communication by means of a corridor with the assistant medical officer's house. The residence of the medical superintendent is on the west side of the main buildings, and 300yds. still further to the west is the isolation hospital.



CORK INTERNATIONAL EXHIBITION, 1902: SITE PLAN.

CORK INTERNATIONAL EXHIBITION.

AN Exhibition of Irish Industries was as great an opportunity for Irish architects to distinguish themselves as it was for Irish farmers, manufacturers and merchants, but it must be admitted that though the latter have risen to the occasion with considerable success the former have let the opportunity pass. Ireland is undoubtedly in need of every advertisement that can be given it, and the Cork International Exhibition offered an opportunity of advancing the interests of the country to a very great extent, and in the benefits which it is hoped will follow the architectural profession will share considerably. The exhibition is not a local one, but national, though Cork no doubt will deservedly benefit mostly by it. Of course, it was only to be expected that little money would be available for spending on the buildings, but that is no reason why the result should be so poor. Under the circumstances, however, it will be unnecessary to enter into any detailed criticism of the buildings, as to what they are, but only as to what they might have been.

Assuming the small amount of money available for their erection, and for the exhibition generally, it was useless to expect commissions to go to architects for the design of the buildings. Appreciating this fact, Mr. H. A. Cutler generously came forward with the offer of his services as honorary architect. The labour entailed upon him must have been considerable. In the circumstances the proper thing would have been for the leading Irish architects to have offered their services to design some of the buildings in consultation with each other, with one of their number as supervisor, just as has been done in the United States in some instances. Maybe, if builders, manufacturers and merchants had been approached, they would have lent or given materials and labour simply for the advertisement. Such a procedure would have undoubtedly given good results and been a credit and benefit to all concerned, and the exhibition would have gained greatly in popularity. It would be unfair to criticise at all severely the work of Mr. H. A. Cutler as honorary architect, though probably he will not be adverse to receiving any good-humoured remarks we may make.

The exhibition, we must frankly confess, seems to us a failure architecturally, though it is a considerable success so far as its immediate purpose is concerned, and this success must be attributed to the beauty of the site, the patriotic way in which Irish business firms have come forward, and the number of side-shows and attractions that are offered to keep the public amused. In this last direction the Cork Exhibition is an example to Wolverhampton, having far more amusements than the latter; and as the Irish people have had far less experience of exhibitions than the Black Country folk, the exhibits are far more striking proportionately. Even for strangers the exhibition is of much interest, for the site is a very beautiful one, and any buildings would have looked well among the trees on the banks of the River Lee; besides which the comprehensive exhibits of Irish industries are new to most persons. The Department of Agriculture and Technical In-

struction of Ireland has greatly aided the success of the exhibition and should do much in the way of instructing agriculturists and others. The Department is performing excellent work in the instruction of the peasantry in art work, &c., such as weaving, lace-making, wood-carving, toy-making, &c., and examples and demonstrations are shown in all the branches it deals with.

The idea of promoting the exhibition this year was due to the Rt. Hon. Edward Fitzgerald, Lord Mayor of Cork, and at his instigation a public meeting was held in March, 1901, to promote the scheme, and an executive committee of leading citizens formed. Mr. H. A. Cutler, A.M.I.C.E., the city engineer of Cork, as already explained, was appointed honorary architect, and Mr. R. A. Atkins, J.P., hon. secretary. It was originally intended to hold the exhibition on the site of the exhibition of 1883, at the rear of the municipal buildings, but the ground space was found quite insufficient for the purpose, the project having grown so successfully.

The site of the exhibition is on the southern bank of the River Lee, encompassed between the river and an avenue of trees known as the Mardyke. The area of the building is 15 acres, and the grounds are magnificently wooded with tall ivy-clad elms, extending to about 40 acres, their entire length exceeding three-quarters of a mile. The main entrances to the exhibition are in the Western Road, opposite the gate of Queen's College. The western entrance, which leads directly into the Industrial Hall, is also on the Western Road.

Entering by the gate in the Mardyke Walk, on the left is the small post-office, and further on the Grand Concert Hall. Directly in front are the President's Pavilion and offices of the Executive Department. Past the President's Pavilion, to the right, are the cricket, tennis and sports grounds, with various side-shows and restaurants. Passing by the Concert Hall we come to the Father Mathew Memorial Fountain and Pavilion (memorials to this "Apostle of Temperance"). On the right-hand, past this pavilion, is a shell bandstand, facing which is the main entrance to the Industrial Hall, approached by a flight of steps of Irish greenstone. The Machinery Hall is directly behind the Concert Hall, and is an annexe in front of the Industrial Hall, on the left-hand of the entrance to the latter. One passes by the Industrial Hall on the left, with the water-chute on the right-hand. Various small pavilions and restaurants are here situated, and behind them is the Canadian Pavilion. Behind the Industrial Hall are situated an Aquarium, Creamery and Art Gallery; behind these again is the Switchback Railway; and beyond are the Government agricultural exhibits and a model labourer's cottage.

The Industrial Hall as we should expect from the character of Irish industries, is the largest of the exhibition buildings. It has a floor space of about 170,000ft., and consists of seven parallel avenues with one transverse avenue, the latter forming a junction for the Industrial Hall and the Machinery Hall adjoining. The Grand Entrance is situated in the centre of the main façade and has an unroofed Corinthian portico projecting in front on a low flight of steps. A dome rises above, and the junction with the square is managed by placing four small turrets at the angles. On the top of the dome is a cupola

consisting of a ring of columns with a small conical roof above. In the front of the dome is a large clock, which is entirely out of proportion. The angle turrets, too, are in bad proportion, and the dome itself is too low and small to dominate the front as it should do, the square towers at the end being distracting. The interior of the dome is perhaps the most pleasing part of the buildings, being excellent in proportion and very neat. The four bays under the pendentives are occupied by an enquiry office and railway companies' offices. The avenues of the hall are roofed with laminated curved wooden roof-trusses similar to those used at Glasgow last year.

Taking the Grand or Central Avenue as a dividing line, we may roughly divide the Industrial Hall as follows:—The Women's Section, situated on the northern or river side, and covering 3,000ft. super (here are represented various convent industries, such as lace-making, shawls, &c.). Adjoining is the space devoted to the Department of Agriculture and Technical Instruction, which covers an area of 15,000ft. super. (here demonstrations are given of the smaller industries which might be profitably worked in Ireland, such as woodcarving, toy-making, pottery, metalwork, &c.). On the southern side of the Grand Avenue are corridors occupied by miscellaneous industrial exhibits.

Just round the northern corner of the main front there is another entrance to the Hall, formed by a projecting verandah with concave-curved roof, between two towers, of similar design to those at the ends of the main front, the return face of one of these two towers indeed forming the left-hand tower of the side entrance. Over the verandah roof, between the towers, is a pointed gable, forming the finish of the roof of the transverse gallery running along the main front, and from which the seven parallel avenues branch off. In this gable is a large semicircular window. This entrance is more happily proportioned than the main one, but is considerably marred by the verandah, which is not massive enough in feeling and projects too far over the towers laterally. These two towers on this northern side of the Industrial Hall are not balanced by any at the other end, which terminates very abruptly.

The colouring of the buildings is generally white, and this is very pleasing amongst the masses of green foliage. The dome is covered with canvas, tinted tile-red, a colour which is not nearly so appropriate or so delicately rich as silver or gold, as used at the Glasgow Exhibition. The roofs of the corner towers are also red, and here the colour seems more appropriate, their shape allowing of a suggestion of tiles. We do not, however, believe in the endeavour to imitate one material in another, such as in these roofs; the effect must be displeasing, and on such a surface as a dome it would be bad construction to use tiles, and the natural association of red roofs with tiles causes the colour of this dome to grate harshly upon the eye. Otherwise, the roofs of the hall are coloured white and look well. The ornamental work, such as mouldings and columns, including the caps and bases of the latter, is executed in fibrous plaster. The semicircular windows of the hall are neatly moulded and their general shape would be appropriate in stone. The hall is lighted and ventilated from the roof, front and sides.

In size and exhibits, though not in design,

the Machinery Hall is the second building in importance in the exhibition. It is 200ft. long by 100ft. wide. The Concert Hall is 150ft. long by 86ft. wide; the ceiling being 50ft. clear in height from the floor, and the roof-span 60ft. The building is rectangular in shape, and at the angles are four towers, each 60ft. high, which have no use, and are not pleasing in shape or modelling. The exterior of this building is indeed the most displeasing of any in the exhibition. The plan of the hall is arranged as nave and aisles, the nave being roofed with large laminated wood trusses, semicircular below. The roof is open except at the tiered orchestra end, where a boarded barrel-vault follows the curve of the trusses. At the back is a large organ of neat design, specially built by a local organ-builder, Mr. T. W. Magahy, of Cork, at a cost of £1,200, having a frontage of 27ft., and standing 30ft. high, the depth from back to front being about 14ft. The acoustics of this hall are good, but might have been improved if the back of this barrel-vault had been coved down elliptically in order to deflect the sound down to the back of the hall. The back wall (*i.e.*, that facing the organ) is simply covered inside with gauzy cloth, and externally with canvas, and if it had not been for this the sound waves would no doubt have been reflected from it, probably causing a very bad echo. As it is the canvas allows the sound waves to disperse rapidly. The principal entrance to the Concert Hall is between the two towers at the corners, under a colonnade and portico. In the triangular gable is a large clock, and below it the canvas is treated in square panels divided by double pilasters. Similar panels run along the clearstory above the aisle roofs. In this clearstory there are no windows, the light being obtained from skylights over the nave and from an end window in the front, with windows in the aisle walls. The walls are coloured white, the panels being coloured a light brown in the centre, and the pilasters and borders coloured dark brown. The roof over the aisles is concavely curved and coloured red. The felt roof over the nave is left its original black colour. The back wall is also covered with felt, and has been left a bare badly-proportioned mass. The glass skylights on top of the roof are raised slightly for ventilation purposes. The hall has seating accommodation for 2,000 persons, whilst the organ loft and gallery affords room for an orchestra and choir of 500.

All the buildings in the exhibition have been designed by Mr. Henry A. Cutler, A.M.I.C.E., with the exception of the Canadian section, the President's Pavilion and the central shell bandstand, which were designed by Mr. A. Hill, B.E. Mr. Cutler is also responsible for the laying-out



CORK INTERNATIONAL EXHIBITION: GENERAL VIEW FROM THE WATER-CHUTE SHOWING THE INDUSTRIAL HALL TO THE RIGHT. H. A. CUTLER, A.M.I.C.E., ARCHITECT.

of the site. Mr. William O'Connell, of Hanover Street, Cork, was the builder of the whole of exhibition buildings. The entire electric lighting and power transmission installation has been carried out by Messrs. Porte & Co., of Dublin and Cork.

The Canadian Pavilion is not worthy of special notice, but the President's Pavilion is a pleasing little structure in drab concrete, with red-tiled roof, dormer windows and ornamental porched entrance. The interior has been furnished and decorated by Messrs. Norman & Stacey, of London.

The shell bandstand, also from designs by Mr. Hill, is semicircular on plan, and has a decorated plaster cornice, with shield ornament in the centre of the arch. Although this shield lifts the arch up, it is not well modelled. The small minarets at the corners are out of keeping and look paltry. The interior curve of the reflecting wall is properly elliptical in form; it is of wood panelling, which acts excellently. There is, however, a most distressing echo caused by the bandstand being placed directly opposite the front of the Industrial Hall, which, being

boarded and of large flat expanse, might have been expected to reflect the sound waves back very little diminished in volume. Wood forms an excellent material for sound reflection, and we should have thought the action of so large a surface facing a bandstand would have been foreseen. The knowledge of the principles of acoustics is not so elementary that the effect could not have been calculated. There was no reason why the bandstand could not have been turned away from any building, when no such echo would have occurred. When there are a large number of persons around the bandstand the effect is not so noticeable, as a crowd has excellent sound-absorbing power, but the clash of cymbals and the notes of a big drum even then produce an echo, and there is always present a reverberation that blurs the hearing.

Another interesting building is a cottage erected by the Portable Building Co., Ltd., of Fleetwood and Manchester. This serves as the hon. secretary's and hon. architect's office. The walls are constructed of unplanned deal framing, covered outside partly with matchboarding and partly with rustic joint weatherboarding $\frac{3}{4}$ in. thick. The external walls are lined with inodorous sheet felt and matchboarding, and the partitions are matchboarded on both sides. The ceilings are similarly boarded, and, where beneath the roof, felted as well. The roof is covered with Brosely tiles.

The Art Galleries are erected of galvanised iron and non-flammable wood, so that it is impossible for the building to catch fire.

The Father Mathew Memorial Fountain is situated in front of the Industrial Hall, and was designed by Mr. Cutler and erected by Mr. J. Hegarty, builder, of Cork. It is constructed of cement supplied by the Irish Portland Cement Co., and the decorations consist of Irish interlaced and other ornaments.

With regard to the design of the buildings generally, the character of the work does not seem to have been grasped. Where constructed of plaster and boards and battens for a mere temporary purpose, the appropriate treatment is to make them light and playful, decorative in character with a plentiful use of colour. Their first condition is no doubt to house the exhibits, their second and only other to please the eye. And the materials should be used as what they are, and no endeavour should be made to imitate forms appropriate to other permanent materials. The treatment should be scenic in so far as the materials are the same as used in scenery and in so far as they are required to appeal to the eye, but they must not be used to imitate other materials as theatrical scenery has to do. Even the latter must be conventional in its rendering. Where there is plenty of money available, of course much may be done in the way of ornamental painting and plaster



CORK INTERNATIONAL EXHIBITION: THE CONCERT HALL. H. A. CUTLER, A.M.I.C.E., ARCHITECT.

decorations on buildings, but where these cannot be used largely good effects can be obtained by tinting the walls in various colours and harmoniously disposing the masses of the buildings. At Cork we see the futility of using Classic features and ornament, which are appropriate only in stone buildings. The portico of the Industrial Hall is particularly weak in this respect with its plaster Corinthian caps and wood and plaster cornice. In fact this portico is entirely out of keeping with the rest of the building, which is not Classic in treatment. Then again at Cork we see the mistake of imitating constructive forms which have arisen from utilitarian conditions and needs where no such similar conditions prevail, such as in the towers of the Concert Hall, which are modelled as though they had a purpose apart from decorative effect; and in the jointing of the boarded walls of the Industrial Hall, which is made to imitate stone. The towers, if used at all, should have been plainly apparent battens and canvas, and used for graphic and plastic effect alone, *i.e.*, to obtain graceful lines, masses and planes. The walls should have been treated as wooden boards. The masses of all the buildings have, on the whole, received very little consideration, and we are compelled to refer again to Mr. James Miller's advice on this subject to which we referred in the article on the Wolverhampton Exhibition in our last issue. However, we live and learn, and judgments can only be formed from examples. The Wolverhampton and Cork Exhibition buildings have served a good purpose if they merely confirm our opinions in this respect.

The Exhibits.

The exhibits are many and various, on the whole being agricultural or of Irish industries. The chief feature is the exhibit of the Department of Agriculture and Technical Instruction for Ireland, which shows in the Industrial Hall work for the various technical schools in Ireland, England, Scotland and elsewhere. The Arts and Crafts School in Regent Street and other London County Council technical classes have noticeable exhibits. Mr. Harold Rathbone offers an example of what might be done with Irish clays at his stand with specimens of Della Robbia pottery from Birkenhead. In the Canadian Pavilion is a collection of timber from that country, and in a Forestry Pavilion of the Department of Agriculture, &c., is a collection of English and Irish timbers. The Department also exhibits examples of art fabrics of all kinds, examples of woodcarving, pottery, glass, &c., specimens of Irish building stones, clays, minerals, and a model labourer's cottage. This latter is nothing out of the ordinary, but affords a good example to the peasantry of Ireland in the way of cleanliness and neat furnishing with home-made carpentry of the cheapest kind.

The Art Exhibition is a very good one, and contains many famous works of English artists living and dead, such as Cope's "Village Schoolmaster"; Leighton's "Bather"; Lewis's "In the Bey's Garden"; J. W. Waterhouse's "Mariamne" and "Circe"; several works by Millais and G. F. Watts; a Rosa Bonheur; Frith's "Derby Day," Holman Hunt's "After Glow in Egypt"; works by La Thangue, Harold Speed, J. J. Shannon, Herkomer, Arnesby Brown, Briton Riviere, W. L. Wyllie, MacWhirter, Tuke, Macbeth, Albert Goodwin, Seymour Lucas, Sir W. B. Richmond, Alfred East, Poynter, Sargent, Mulready and Maclise. A bronze statuette of R. L. Stevenson by D. W. Stevenson, R.S.A., a bronze statuette of "Victory" by Alfred Gilbert, two bronzes by Onslow Ford, and two also by Hamo Thornycroft.

Mr. R. Phené Spiers, F.R.I.B.A., exhibits two architectural water-colour drawings, Mr. John Fulleylove a fine water-colour of Ely Cathedral, and Mr. H. W. Brewer a drawing of Glasgow Exhibition. The Historic Loan Collections contains many examples of art metal work, chairs and cabinet work. In the Shrubberies House are a few drawings and photographs of buildings designed by Cork architects, which do not generally enhance their reputations. A drawing of the Cork Exhibition of 1883 by the architect, Mr. Robert Walker, A.M.I.C.E., is very interesting in view of the present one. The exhibition of 1883 was entirely covered in, no provision being made for out-door amusements, and was very similar to the present

Industrial Hall, which is alone larger than its forerunner. The other architects represented in this collection are Messrs. Albert Murray, R.H.A.; D. J. Coakley; Arthur Hill, B.E., M.R.I.A.; and Samuel Hynes, F.R.I.B.A. The collection is a very poor one and is badly lighted. It is to be regretted that an exhibition of drawings and photographs of the works of Irish architects in general was not held, as such an exhibition would have been of great interest.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Tinning Wrought-Iron.

BRIDGNORTH.—G. B. writes: "What is the best flux to use for tinning wrought-iron so as to take lead?"

For soldering to wrought-iron I have used ordinary tinman's solder and chloride of zinc, rubbing the soldering iron or copper bit in a lump of sal-ammoniac. The metal requires previous cleaning with weak hydrochloric acid or a 1 per cent. solution of sulphuric acid, and making fairly hot. For making tinsplate the sheets are prepared in this way and then dipped in molten tin having the surface protected by a layer of sal-ammoniac. HENRY ADAMS.

Surveyors' Charges.

NEMO writes: "What would a surveyor's charges be for surveying and making a general plan of an estate of about 10 acres to be laid out for building purposes?"

It is quite impossible to forecast what the cost would be, knowing nothing of the nature of the site or means of access. A surveyor's charges would be computed by the time occupied, and this means his own time and two assistants. If the site is level (you do not say if you require levels as well) and clear with straight boundaries, the work would occupy a day and the charge would probably be about £10 10s. But naturally it would be a longer business if the boundaries are intricate and obscured, with levels changing every few feet. Your best course would be to put yourself in the hands of a reliable surveyor, give him all the information he requires, and obtain from him a statement of his charges. R. W. C.

Brant Broughton Church.

OLDHAM.—T. J. H. writes: "Kindly give some information about Brant Broughton church in Lincolnshire."

The parish church of Brant Broughton in Lincolnshire is one which has been robbed of three parts of its interest through indiscriminate restoration. It is built of Ancaster stone from the quarries which lie only ten miles away. Originally it was built in the Decorated and Perpendicular styles, but has been "thoroughly restored"—which is in itself a clear description of the present state of the fabric—and the chancel entirely rebuilt. It still contains some fine specimens of stained glass and some good carved oak. If a fuller description is required it would be better to consult a local guide-book (but these are generally inaccurate) or write to the vicar. R. W. C.

The Arthur Cates Prize.

LONDON.—STUDENT writes: "For this award studies of subjects of Classical or Renaissance and of Mediaeval Architecture, accurately drawn in perspective and shaded by rule, are requested. What particular subjects would be suitable? What books would be helpful? Where can examples of this kind of work be seen?"

The subject selected should be one that appeals to the student personally but should be a good example of the period. The book most useful to you will be R. Phené Spiers's "Architectural Drawing" (Cassell & Co., Ltd. 7s. 6d. nett).

Government Surveyors

BELFAST.—URGENT writes: "What are the qualifications necessary for an appointment as assistant in any of the quantity surveyor's department of the Government offices (such as the War Office) and to whom should I apply for particulars?"

Particulars can be obtained from the secretary, Civil Service Commissioners, 68, Victoria Street, S.W.

Salaries of Architectural Draughtsmen.

LONDON, N.W.—ESCUTCHEON writes: "What is the average salary of a draughtsman in an architectural office capable of writing specifications and preparing working drawings, &c.?"

Draughtsmen with such knowledge as you state are poorly paid on the whole. Of course the salary all depends on the ability, knowledge and experience of the individual, which may vary to any extent within the terms of your enquiry, from £1 to £4 per week, but the average is about 30s. a week.

Model Dwellings for the Working Classes.

WALES.—ENQUIRER writes: "Where could I see the most recent buildings of the above class erected by the London County Council?"

On the Millbank Estate, at the back of the Tate Gallery, and on the Boundary Street area at Shoreditch. The Council recently published a book on "London Housing," in which plans and particulars of the buildings are given.

HOUSING OF THE WORKING CLASSES.

Report of the Select Committee.

THE report of the Joint Select Committee on the Housing of the Working Classes was issued recently. The Committee report as follows:—

1. We submit two model clauses and three corresponding standing orders which we recommend in place of the present model clauses and standing orders 38 and 111 (H.L.), 38 and 183A (H.C.), dealing with London and all places outside London respectively.

2. We suggest that the model clauses be embodied in a public general Act of Parliament.

3. After hearing evidence and consulting the officials of the Home Office and Local Government Board, we have come to the conclusion that in London it is desirable that every case in which houses of the labouring class are proposed to be taken should be notified to the central authority, while outside London it is sufficient that the attention of the central authority should be called to cases in which thirty persons belonging to the labouring class are displaced in one borough, urban district or rural parish, as the case may be.

4. In settling schemes for providing new houses in place of those demolished, we think it advisable that the central authority should exercise a full discretion.

5. We recommend that the new houses to be provided be suitable for persons of the labouring class, and not too ambitious in character and design. We attach much importance to these conditions.

6. It will be observed that the area within which the new houses may be provided under a scheme is left by us wholly to the discretion of the central authority. It may be, and we think will be, found expedient in some cases to erect the new houses at some considerable distance from the houses demolished, and not necessarily within the jurisdiction of the same local authority.

7. We recommend that in London the central authority be empowered to fix all rents for the new houses. On this point we are not agreed. The above decision was arrived at on a division by six votes to three.

8. In regard to Ireland and Scotland, we were informed that neither the Lord Lieutenant of Ireland nor the Secretary for Scotland desired to make any suggestions to us. So far as we can judge, our recommendations for places outside London are, with the necessary alterations suitable for Ireland and Scotland.

AN INTERNATIONAL FIRE EXHIBITION.

OWING to the increasing interest displayed in questions of fire protection, the British Fire Prevention Committee has been invited to aid in organising an International Fire Exhibition to be held next year at Earl's Court from May to October. The whole of the business arrangements will be undertaken by the London Exhibitions, Ltd., whose extensive buildings and gardens at Earl's Court will be entirely devoted to this exhibition. The organisers will be assisted by an influential Advisory Council, representing all the interests involved, and special sub-committees will be formed in different foreign countries with the view of making the international element thoroughly representative. Every possible effort will be made to ensure that the exhibition shall be eminently practical and instructive and present an exhaustive picture of everything relating to the subject. The classification of exhibits into groups and divisions will receive most careful attention; the question of fire-preventive methods of building construction and equipment will be accorded equal importance with the question of fire-brigade work and organisation. As one of the objects of the exhibition will be to trace, step by step, the progress of fire protection from past to present, there will also be an Historical and Literary Section, including an art gallery for the illustration of the gradual development of the subject. It is the intention of the British Fire Prevention Committee to arrange for a series of diplomas for medals to be awarded to exhibitors in the different groups and classes; but in order to enhance the value of the distinction these awards will be strictly limited in number, and only issued with the aid of juries with high expert knowledge. Arrangements will be made for fire-brigades' and ambulance tournaments, displays and competitions, and it is also intended to hold an international congress of experts in connection with the exhibition.

Group 1, Fire Prevention, will include the following four sections:—

(1) *Building Construction*.—Fire-resisting materials and systems of construction; steel construction; wood construction; doors and glazing; screens, shutters and blinds; protective coverings; impregnated materials.

(2) *Building Equipments*.—Theatres and places of public entertainment; workshops, factories, warehouses and docks; hospitals, prisons and asylums; churches and places of worship; museums and galleries; gunpowder factories and storage of explosives; oil stores, ships and wagons; ship equipment; equipment of mines, &c.; safes, banks and deposit buildings.



WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION: THE CONCERT HALL.
WALKER AND RAMSAY, ARCHITECTS.

(3) *Electrical Safeguards*.—Wiring safeguards, conduits, casings, &c.; switchboards, fuse-boxes and registering appliances, &c.; lightning conductors, &c.

(4) *Heating Safeguards*.—Stoves, ovens and flues; cleansing of chimneys; hot-water, hot-air and steam-heating appliances; pipe casings and coverings.

Co-operation both from the United States and the Continent is assured, and many promises of influential support from the leading representatives of the learned societies and professional bodies have already been given, particulars of which will be furnished later.

Wolverhampton Exhibition.—The accompanying illustrations (which we were unable to include in the article published last week) show the Concert Hall and the interior of the Industrial Hall. They are both from photographs by Messrs. Whitlock & Sons, Ltd. The plan of the Concert Hall is rectangular, the stage being placed on one of the long sides. The elevation is not in the least expressive of the purpose of the building, nor does the shape of the hall give the best acoustical results. The chief interest of the Industrial Hall is the roof, which is of laminated wood trusses similar to those used at Glasgow.



WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION: THE INDUSTRIAL HALL.
WALKER AND RAMSAY, ARCHITECTS.

Correspondence.

Buildings in the Neighbourhood of Torquay.

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—To your correspondent's remarks relative to the above on p. 386 of your issue for July 30th it may be added that although Torquay is, comparatively, an entirely new town the church of St. John the Evangelist, situated just over the Strand, and that at Babbacombe, a suburb, are both worthy of attention. The latter is by the late Mr. Butterfield, and is remarkable for its exquisite (local) marble work. The former is one of the late Mr. G. E. Street's best works. Its saddle-back west tower and the huge font for adult immersion, made from a great block of red Ippelen marble (Devon), and approached by steps in the same material leading down into water from the west end of the nave, are amongst its almost unique features. The church of St. George and St. Mary (there is only one other ancient church of similar dedication in this country) at Cockington is chiefly renowned for its old font cover, which stand stationary upon a fifteenth-century font, on which are some interesting old brasses. St. Mary's, Totnes, contains the finest stone screen (from the Beer quarries) in Devonshire—perhaps, indeed, the grandest fifteenth-century one of stone in any parish church in England. The original instructions by the donors were to make it similar to the screen west of the Lady Chapel in Exeter Cathedral; but whilst very much like the latter in detail it far exceeds it in beauty and elaborate detail. It is 60ft. long, and has parclose screens appended to it of unusual design. The only other stone screens (all of Beer) in Devon are to be seen in the churches of Hemyock, Ottery St. Mary, Culmstock, Bideford, Awliscombe, Colyton and Paignton. St. Saviour's, Dartmouth, possesses a fine fifteenth-century chancel screen and ornate pulpits, a most interesting Jacobean gallery, and a south porch covered with unrivalled old iron-work. The ruins of the ancient castle, with the equally old church of St. Petrox—the one almost part and parcel of the other—are situated upon an eminence at the mouth of the Dart. There are several good churches upon the banks of the Dart. The church at Stoke Gabriel is one of these. Its old oak fifteenth-century pulpit is only 2ft. in diameter inside measurement. This narrowness is somewhat of a Devonshire characteristic. That at Chittlehampton is the smallest, being slightly over 18in. in diameter. At Holne Church, near the head of the Dart, is a fifteenth-century oak pulpit quite unlike any other in the county. At Staverton, another church on the Dart, is a fifteenth-century carved oak screen 50ft. long and 15ft. high, with seventeen bays.—Yours truly,

HARRY HEMS.

Bricks and Mortar.

APHORISM FOR THE WEEK.

When thou buildest a new house, then thou shalt make a battlement for thy roof, that thou bring not blood upon thine house, if any man fall from thence.—Deuteronomy.

Our Plates. THE new residence on London Road, Newark, has been erected for Mr. Oliver Quibell and contains dining room, drawing- and morning-room, with sitting hall, together with the usual kitchen offices and out-buildings. The exterior is constructed of red sand bricks, the upper portion being of cement rough-cast, and the roof covered with red tiles. The cornice is constructed of wood, and, with the rest of the exterior woodwork, is painted white. The work has been carried out by Mr. William Smith, builder, of Newark, from designs by Messrs. Brewill & Baily, architects, of Nottingham.—"Littleshaw" is being built at the top of one of the steep hills near Woldingham Station, and the exigencies of the site necessitated the arrangement adopted. The house is to be finished with rough-cast with cement "dressings," and it is intended to cover the roof with stone slates. The work is being carried out by Messrs. Maides & Harper, of Croydon, under the direction of the architect, Mr. Leonard Stokes, of 2, Great Smith Street, Westminster. The drawing is by Mr. Geoffrey Lucas, F.R.I.B.A.—The Venetian Saloon at Carlton Towers (Lord Beaumont's house in Yorkshire) had already been built before Mr. Bentley undertook the work of decoration. Every item, other than structural, is from his hand: the painting, the woodwork, the fire-grate, the chandeliers, the furniture, fixed and movable. The room is of such a size that it is neither habitable nor inhabited, but is to be used for purposes of display on occasion. The decorative treatment is not successful. There is a want of purpose about the decoration; the parts do not contribute to accentuate one another, or to lead to some prepared climax; nor have they, as in Mr. Burges's work, a story to tell, which is their justification.

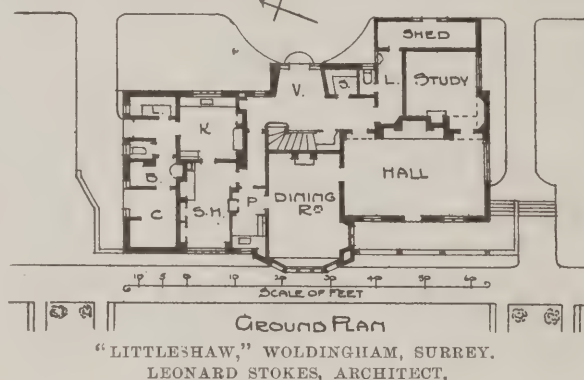
Byzantine Civil Architecture. GENERAL L. DE BEYLIÉ has published a monograph, "L'Habitation Byzantine" (Grenoble, Falque and Paris: Leroux), on one of those obscure subjects which can only be adequately dealt with by a patient investigator with the best part of a lifetime to spare and little hope of pecuniary reward. His researches on the civil architecture of the Byzantine peoples and its influence in Europe is a most valuable contribution to the history of art, and will now form the leading and almost the only authority on the subject. It includes 400 illustrations drawn from existing remains, manuscripts, ivories, mosaics and other authentic sources, and among these the collection of furniture and domestic implements is especially notable.

Castles of Palestine. DR. SELLIN, Professor of Protestant Theology at the Vienna University, who is now engaged in exploration in Palestine, announces the discovery of four castles or fortresses under a mound near Jaffa. In the middle were the ruins of an Arabian castle; on the east, a castle of the period of King Solomon; on the north-west, one of a late Israelite period; whilst on the west was found the earliest of them all, one of pre-Israelite or Canaanite date. The Canaanite castle is built of unhewn blocks of stone, which show no marks of the chisel. The Professor puts the date of this castle at about 2000 B.C., and suggests that it was destroyed by the Israelites, perhaps under Solomon, who proceeded to build their own fortress. Though this second building has also suffered considerably, enough remains to show that it belongs to the so-called Solomon castles.

The late Israelite castle appears to have been a fortress only. The Arabian castle shows more architectural skill than the others in its arches, &c., and recalls the style of the period of Haroun-al-Ra-hid. The number of antiquities unearthed is so great as to give a clear and comprehensive picture of the state of civilisation of the inhabitants. Among the objects uncovered is an altar hewn out of solid rock, which was found in a burial-place.

An Old House in York.

It appears that the picturesque old two-gabled house in High Ousegate is in danger of destruction. It dates from the fifteenth century, and in Queen Elizabeth's reign was occupied by Henry Thompson, a York merchant. It has been the residence of a Lord Mayor of York, sheriffs, magistrates, and one governor at least of the Merchants' Company. The carved woodwork on the gables was added in 1635, as is shown by the date thereon, and the carved negro heads were affixed about that date by the then occupier, an East India merchant, to indicate his calling. At that time the general impression was that all Asiatics were black, and a negro was the only type then known of black men. Not more than twenty-five years ago the house contained carved mantelpieces and wainscotted rooms, one of which was a reception-room frequently used before York possessed a Mansion House. The exigencies of trade have,



however, caused much destruction and many alterations to the interior. It seems a great pity that this interesting feature of York, and especially High Ousegate, should be swept away. About ninety-five years ago, when the present Ouse Bridge was built, both sides of Low Ousegate consisted of houses of the same period, but these were destroyed when the bridge was built, and this house is the only one that remains of that type in the two Ousegates.

Newgate.

IN the course of a few days grim and forbidding Newgate Gaol will be in the hands of the housebreaker. The task before the housebreakers is a tough one—for Newgate Gaol was built as a fortress, and is probably one of the strongest buildings in the metropolis, scarcely excepting the Tower. The walls are over 3ft. thick, and in some places over 4ft., and are composed of solid Portland stone slabs 4ft. or 5ft. long and 3ft. and 4ft. wide. The outer walls are cased on the outside with huge slabs of stone, which are clamped with strong iron rods to an inner slab, the cavity between being filled with solid concrete. So strong are the walls that it took a large number of workmen over three weeks, a little while ago, to get through one, when it was decided to make a small doorway for the purpose of shortening the distance between the condemned cell to the execution platform. It is stated that it will take at least a year to demolish the gaol, and that at some parts it will be necessary to use explosives. In order to provide accommodation for the daily temporary provision of prisoners under trial, but not for convicted criminals, some forty or fifty cells, constructed on a new principle, have been provided in the space between the Old Bailey Sessions House and the gaol. These cells have been built on the patent dove-tailed corrugated steel sheeting system, and are practically steel-lined boxes strong enough to resist any attempt on the part of the inmate to escape.

New Patents.

These patents are open to opposition until September 16th.

1901.—Plaster-of-Paris.—12,724. J. HINDSHAW, 74, Gartside Street, Manchester. One part of powdered whiting is mixed with 8 parts of plaster-of-Paris, and 1 part of alum is added to 12 parts of water when gauging (or sulphuric acid may be used in place of alum). The result is that gas is produced and bubbling follows, so that when set the material is honeycombed, thus producing greater bulk with a given amount, the material being also lighter and a better non-conductor.

Ventilators.—14,958. F. G. BATE, 61, Fore Street, London, E.C.; J. WALTON, 8, Market Street, Shrewsbury; and C. BAUER, 72, Cannon Street, London, E.C. The ventilator consists of a series of segmental arms pivoted to an outer ring, so that when the latter is turned the opening in the centre is enlarged, and *vice versa*—like the iris diaphragm in a lens.

Ball-Valves.—16,788. J. ASKEW, 2, Pember Road, Kilburn Lane, Kensal Rise, London, N.W. An extra arm and float is pivoted eccentrically to the valve-float arm so that the valve is held full open until the cistern is full and is then immediately shut.

Sanitary Pipe Machines.—23,475. W. J. SMITH, Overseal, and J. STANLEY, Albert Village, Church Gresley; both in Leicestershire. A worm is usually employed on a vertical shaft inside a barrel for feeding the clay downwards to the die. To relieve the friction caused by the upward thrust, a ball bearing is introduced between the stop thrust and the part fixed to the worm shaft.

1902.—Sash Windows.—5,924. T. W. and F. R. C. RHODES, both of 18, Fairholt Road, Stoke Newington, London, N. The sashes are hung by chains which pass over a chain wheel secured in the ordinary way.

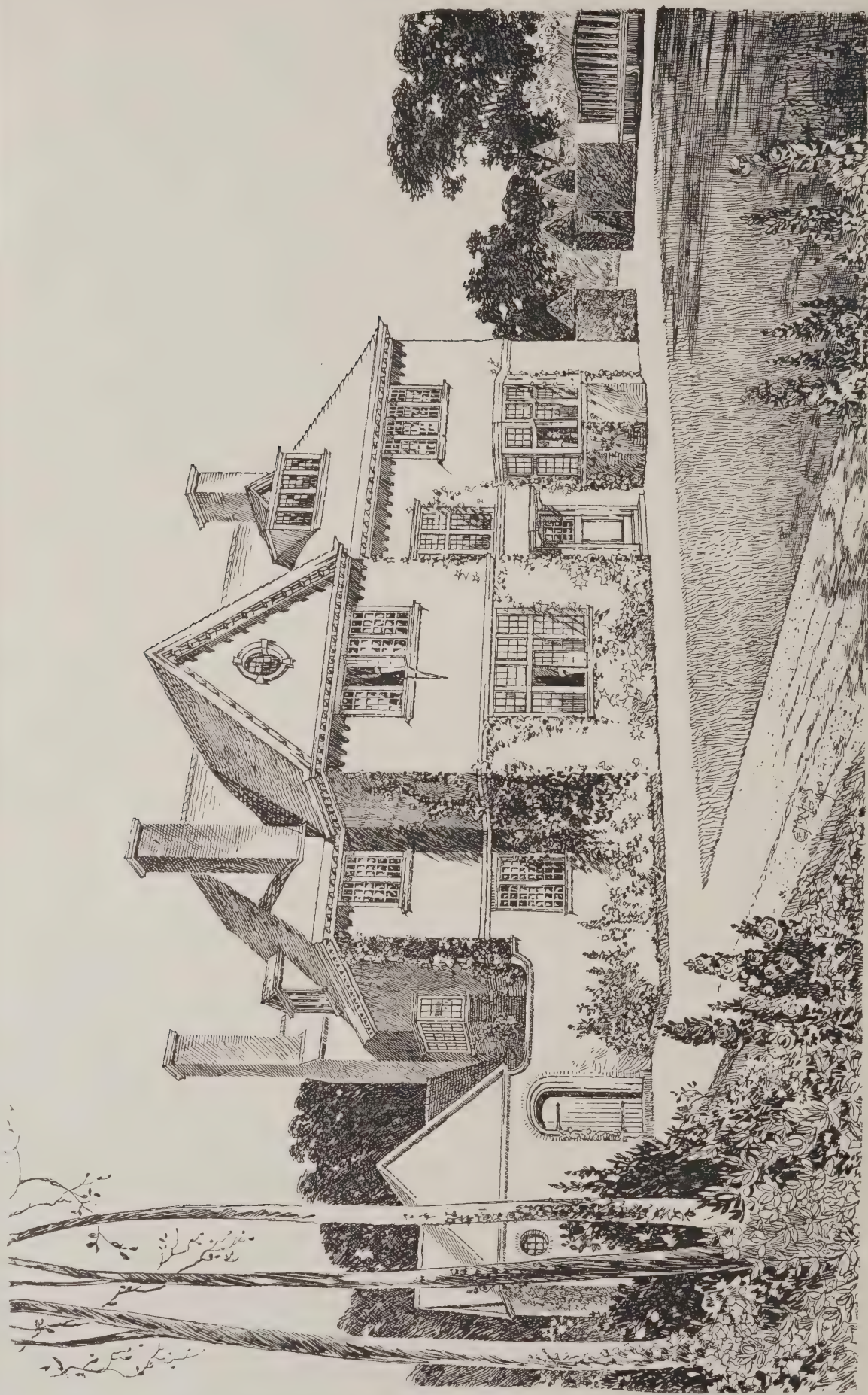
The following specifications were published on Thursday last, and are open to opposition until September 23rd next. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1901.—14,345, BARTY & CAITHNESS, rope grips and pulleys for aerial rope tramways. 14,425, POWELL, barrel bolts. 14,634, CAHOONE, stoves. 14,764, LORRAIN (*Gray*), fire extinguishing apparatus. 15,049, KIRLEW BROTHERS, Ltd., KIRLEW & KIRLEW, jr., handhole cover for boilers. 15,929, HIPPE & HOLM, providing marble, cement, &c., with deeply penetrating designs in colour. 16,400, POTTER, concrete roofs, terraces and coverings to subways. 16,700, WESLINGHOUSE (*Knorr*), supply of heat to kilns. 16,935, SKENE, self-sustaining gear for hoists. 17,756, SUTHERLAND, hand machines for paring, trimming, mortising, &c. 18,042, HONOUR, BUTCHER & WILSON, gas traps of drains and sewers. 18,209, HARTILL, roofing tiles. 18,234, GREENHALGH, shower baths. 18,440, LYON, apparatus for colour shading wood. 18,669, STOCQUART, pneumatic door springs and checks. 19,283, HORAK, fireproof bricks. 19,324, GOERKE, well foundations. 23,552, WINTLE, safety suspending apparatus for lifts. 23,771, BRÜMMER, portable buildings.

1902.—3,504, MANTELL, PRIM & KEITH & BLACKMAN CO., LTD., refrigerators and cold-air chambers. 5,710, ANDERSON, artificial stone or brick. 6,119, UTTENDÖRFER, frames for portable buildings. 8,929, BUTT & BUTT, window blind clip. 9,431, WEILL, imitation marble. 10,967, LANGE, fireplace. 11,205, GOUBEAUT, folding revolving doors. 11,617, OLDENBURG, tools for fixing iron railings. 13,325, PARKER, brick moulding machines.

A Large Cold Stores at Poplar, E., was opened recently. The building was erected about twenty years ago for use as a Midland Railway goods shed, and it is the basement which has been converted into an immense refrigerating chamber capable of receiving 150,000 carcases. The machinery is that of the Linde circulating system, the refrigerating agent being anhydrous ammonia, while the motive power is electricity supplied by the borough.

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RESIDENCE, LONDON ROAD, NEWARK. BREWILL & BAILY, Architects.

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*Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, August 13th, 1902.*



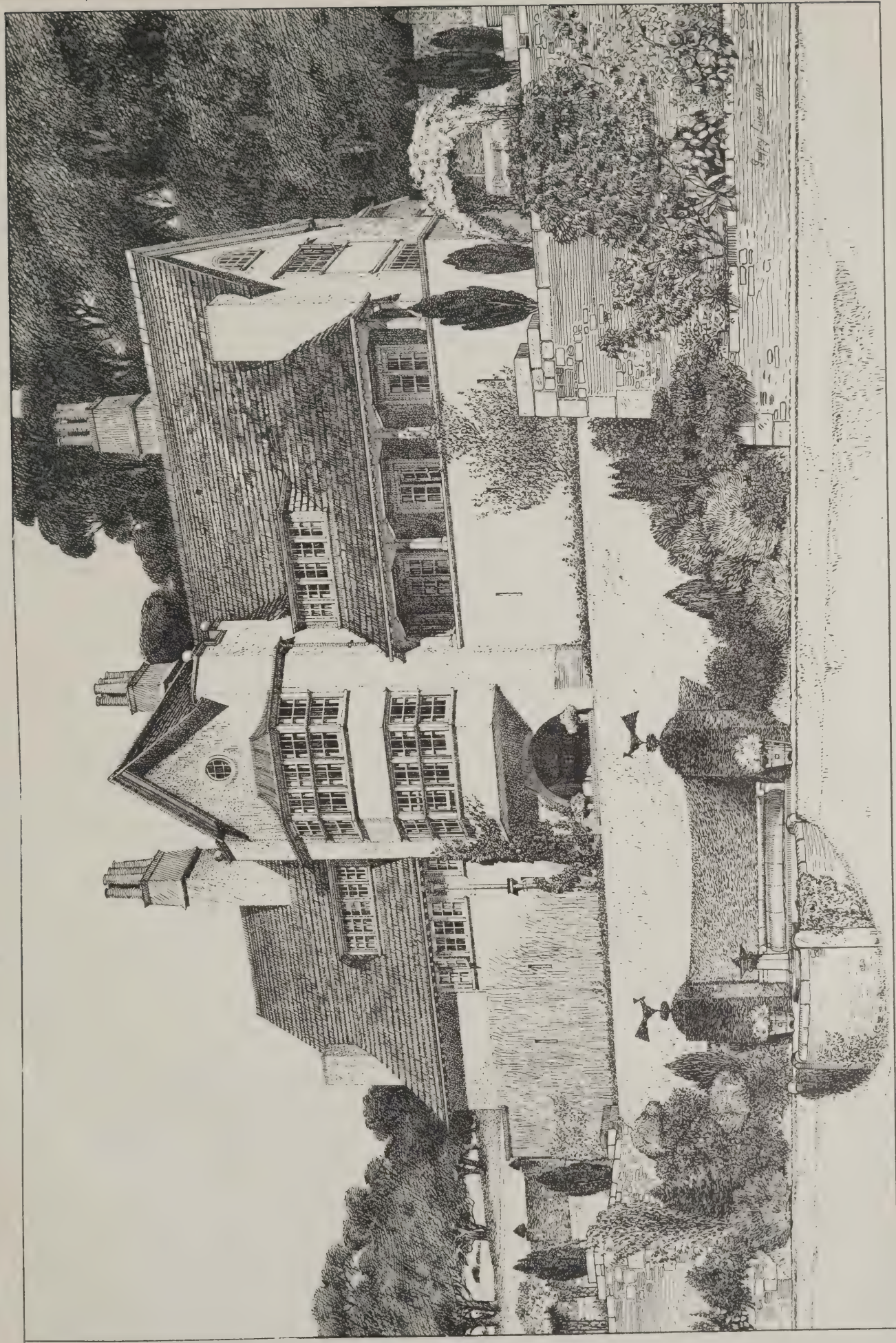


PHOTO E. DOCKREE.

"INK-PHOTO." R. J. EVERETT & SONS, 58 LUDGATE HILL, E.C.

THE VENETIAN SALOON, CARLTON TOWERS, SELBY: LOOKING EAST.
The late J. F. BENTLEY, Architect.

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"LITTLESRAW," WOLDINGHAM. LEONARD STOKES, Architect.

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Law Cases.

Action against a Building Society for Obstruction.

—At the South-Western Police Court recently Mr. Garrett, the presiding magistrate, gave a decision on a summons issued by the Wandsworth Borough Council against the Birkbeck Freehold Land Building Society for erecting an obstruction, in the form of iron railings, at one end of Franciscan Road, Tooting Common. In 1881 the Society's architect (Mr. Hancock) submitted to the Metropolitan Board of Works plans for the laying out of the Society's estate at Tooting Common in four roads, of which Franciscan Road was one. The plans were sanctioned subject to the condition that the roads were kept open; and in due course the local authority took over the lighting, maintenance, &c., of the roads. About eighteen months ago, however, the Society set up a substantial fence of iron railings at that end of Franciscan Road which adjoined the Totterdown estate and, despite the Council's protests, refused to remove it. Counsel for the defendants said that the so-called obstruction was at most merely technical, since the road was not continuous, save for a narrow entrance at one corner to a path leading across the Totterdown estate, beyond the iron railings. The London County Council, which had recently acquired the Totterdown estate for the purpose of erecting workmen's dwellings, and was consequently anxious to secure a direct highway from their estate through the Society's estate and so on to Streatham, had entered into an unholy alliance with the Wandsworth Borough Council with the object of obtaining the Society's land without paying for it. The magistrate in giving judgment said that the case was difficult of decision, because the direct evidence was scanty and the plans produced were obscure and unsatisfactory. Nevertheless, he had come to the conclusion—chiefly on the evidence of his own eyes—that the iron fence did not stand on the Society's property, but on the highway. He therefore held that the iron fence was an obstruction—a technical one, it was true—on the highway, and he imposed on the Society the nominal penalty of 20s., with five guineas costs. He consented to state a case for the consideration of a higher Court.

Contractors' Time Limits: A Scotch Case.—

Sheriff Henderson Begg recently gave his decision in the action of Messrs. Macandrew & Co., builders, of Aberdeen, against Dr. Lawson for £210, being part of the contract price in connection with the erection of the sanatorium at Banchory. The sheriff decided in favour of the plaintiffs. The sanatorium is almost entirely a wooden construction. The central tower is of masonry, but the main buildings are of wood, resting on stone foundations which rise about 2ft. above the ground. The plaintiffs' contract for the carpenter and joiner work was thus a very large one, and the time allowed for the completion of the job was admittedly very short. The defendant's own architect went so far as to assert that it was quite impossible for the plaintiffs to have the work finished within the twelve weeks allowed by the contract. The question to be decided was whether any delay was due to the fault of the defendant or his architect sufficient to relieve the plaintiffs from the observance of their time limit. The chief ground of complaint against the defendant was that he failed to make such arrangements with the contractors for the masonry and the plumberwork as were required to enable the plaintiffs to complete their contract work within the stipulated time. Under the contract with the mason the latter was bound to have the masonry of the whole sanatorium buildings completely finished and ready to be taken off his hands by May 31st, 1900; and if the defendant and his architect had adhered to this arrangement the plaintiffs would have had no cause of complaint; but the masonry of the central tower was not finished till July 6th, and the whole masonry of the sanatorium was not completely finished till October. It did not appear from the proof how or why the period was extended by the defendant. The architect, Mr. Coutts, said that he had nothing whatever to do with the extension of the time to the mason; and it was not said that the mason was in fault or that the plaintiffs were parties to the extension of time. The sheriff was of

opinion that the defendant failed in his duty to the plaintiffs in leaving them to the mercy of the mason as regards time. By his original contracts with the plaintiffs and the mason respectively the defendant had ensured that the masonry should be completely finished five weeks before the date fixed for the completion of the plaintiffs' work; and the latter's time having been subsequently extended by the defendant's architect to July 23rd, the plaintiffs were entitled to assume that the masonry would be completely finished five weeks before that date, viz., by June 18th, 1900. The defendant was not entitled without the consent of the plaintiffs to extend the mason's time so as to render more difficult the completion of the plaintiffs' work within the stipulated period of twelve weeks. With regard to the contract for the plumberwork (an exceptionally large one), the plaintiffs' cause of complaint against the defendant was still stronger. By agreement dated April 14th, 1900, the plumber, Mr. Anderson, was allowed by the defendant three months for the completion of the plumberwork, the time to count from forty-eight hours after intimation from the defendant or his architect that the work of the other contractors was sufficiently advanced to enable him to start. The plumber was thus not bound, in any possible event, to have his work completed sooner than July 16th, that is to say, until a week before the expiration of the plaintiffs' time limit. No intimation appears to have been given to the plumber, but he began his work as soon as he saw he could do so, namely, on July 3rd. He was thus not bound to complete his work till fully ten weeks after the expiration of the plaintiffs' time limit. It is undoubted that the plaintiffs could not completely finish their work till the plumber was done with his. In the sheriff's opinion the defendant clearly failed in his duty to the plaintiffs, in respect of his having made such a contract with the plumber. The next ground of complaint was that the defendant or his architect failed to supply the plaintiffs timely with the requisite working plans and detail drawings. When the plaintiffs had to commence work they were without the working plans, the defendant having retained them for a purpose of his own. As regards the detail drawings, a considerable number of them which should have been supplied before July 23rd were not ready for the plaintiffs when they required them, and some delay was thus occasioned. Judgment for the plaintiffs.

Buxton Lime: Important Case at Birmingham.—

The case of *Newell v. The Aston Junction Co., Ltd.*, was heard before a special jury at the Birmingham Assizes last week. The plaintiff, a master plasterer of Aston, sought damages for breach of warranty. The case concerned the quality of Buxton lime used for the purpose of making plaster. Plaintiff was in the habit of taking sub-contracts for plastering, and, counsel said, he was put in a position calculated to do him a great deal of harm if he were supplied with such bad material that the work he did would not stand and had to be taken out. Not only was there the financial loss, but there was injury to his reputation. For the purpose of plaster-making Buxton lime was not only the most expensive, but the best that could be used. Plaintiff bought that quality of lime from the representative of the defendants. Between March, 1891, and January 22nd, 1902, he purchased sixty tons from the defendants. Much of this turned out good, and the plaintiff only complained when his employers, the owners of the buildings on which he was engaged, came upon him. Counsel explained that it was sometimes found that after the mixing had been gone through the plaster, instead of remaining perfectly flat, began to come up in bubbles, and it was impossible to leave it in position. This happened in the plaintiff's case and the defective plaster had to be cut out, and the plaintiff was put to a great deal of expense and labour in replacing it. Complaint was made to the defendants, who replied that "It would seem that you had some lime a little better burnt than usual, and did not give it sufficient time to slake in the pit. However, we have cautioned our workpeople, and you will have no ground for complaint in the future." Amongst the places at which the work turned out defective was a nurses' home built for the Aston Board of Guardians, and in

that instance the architect retained £200 in respect of bad work. Plaintiff's reputation had suffered so much that his turnover, which, in the six months before this arose was something like £1,000, fell in the next six months to £150.—Thomas Johnson, builder and contractor, stated that he contracted for the building of the nurses' home. He was frequently there, and had no reason to suspect that the plaster was not made properly. He thought it safe to use plaster made from Buxton lime in seven or eight days. His foreman once complained that the plaster was being used too soon. The blistering which afterwards occurred was scattered more or less all over the job, and it was consequently impossible to ask an architect to pass the work. In many places he probed the blisters to find out the cause, and in each case there would be a speck of lime. The blisters varied in size from a pin's head to $\frac{1}{4}$ in. or $\frac{3}{4}$ in.—Edward Skinner, clerk of the works to the Aston Board of Guardians, was in charge of the work at the nurses' home. He had to complain once or twice about the running of the lime. At the commencement plaintiff's men were using a bucket without a handle, and consequently lime escaped into the beds without going through the sieve. His next complaint was that the putty was being used too soon after the running. He complained to the architect, who did not stop plaintiff's men. He did not find any other fault. He corroborated as to the blistering. In answer to the judge he stated that behind the blisters he found bits of lime which had not been properly slaked before being used, and then had slaked afterwards and had blown up the blisters. He thought that would be consistent with an inferior class of lime being mixed with pure Buxton lime.—Mr. Cooper Whitwell, architect, Birmingham, who designed the nurses' home, described the blistering, which he said was more frequent on the walls than the ceilings.—Frederick George Whittall, builder and contractor, said he was of opinion that plaster made from Buxton lime might be used with safety in three days after the putty bed was filled. If used too soon the plaster shrunk and cracked, but he would never anticipate blisters, which were due to the little bits of unslaked lime, arising where Buxton lime was used.—Edward Moorhouse, builder, Sutton Coldfield, who undertook the contract for the electric-light works at Sutton, said he thought that in that case the lime was run about three weeks before it was used and yet it had blistered.—The president of the National Society of Plasterers (Mr. W. Smithies), who examined the walls of the Erdington Nurses' Home, expressed the opinion that the conditions he found were such as should not obtain if the best Buxton hand-picked lime, which the defendants allege to have supplied to the plaintiff, had been used.—A host of witnesses were called in support of the defendants' case. They described the method of working the lime quarries, explained in minute detail how "the best hand-picked Buxton lime" is procured, and gave evidence bearing on its transit. The defendants had proof that every ton of the lime delivered to the plaintiff was consigned to them by the Buxton Lime Co., that it came direct from Buxton to the siding in Windsor Street, and was reconsigned and delivered at the defendants' yard. There their responsibility came to an end. Other customers were supplied with lime from the same trucks as those from which the plaintiff's consignments were taken, but his was the only complaint which the company received. The opinion invariably expressed was that the plaintiff had not used it properly. It was generally conceded that after lime has been converted into putty this should remain in the putty beds at least fourteen days before it was used for plastering purposes, and the plaintiff it was stated had not observed this general rule of the trade. Towards the close of the hearing the jury stopped the case. Subject to his lordship's approval the foreman announced they were satisfied with the evidence they had heard, and found in favour of the defendant company. Judgment was entered accordingly.

Custom in the Building Trade.—At Coventry County Court last week, Mr. Jesse Davis, trading as T. and J. Davis, coal merchants and hauliers, Coventry, claimed from Mr. Heary Hawkes, of Whitmore Brickyard, Kenilworth, the sum of £35 for alleged breach of contract. The question involved was whether there was a custom in

the trade to sell bricks for use in Kenilworth at a different price from those intended for use in Coventry. Plaintiff said he knew of no such custom. He agreed to purchase from defendant, at 19s. per 1,000, to sell them at £1 0s. 9d. to Mr. Whateley, of Kenilworth. Plaintiff never received delivery, and had to purchase from another source at 22s. 6d. to fulfil his contract with Whateley. The judge, in giving a verdict for plaintiff for the amount claimed, said the charge of misrepresentation entirely failed, also the defence of custom raised by defendant.

District Surveyors and Wooden Structures.—On May 15th last a case was heard and decided in the King's Bench Division of the High Court, stated between the mayor, aldermen and councillors of the City of Westminster and certain of the district surveyors, upon the questions relating to the position of surveyors and builders with regard to the erection of wooden stands and other structures under section 84 of the London Building Act (the licensing of which was transferred from the London County Council to the newly constituted boroughs under the London Government Act, 1899). The final order of the Court will doubtless be read with interest. It is as follows:—(1) The powers, duties and liabilities of the district surveyors with respect to the supervision or inspection of wooden structures falling under section 84 of the London Building Act have not been transferred to the City Council and its officers, but the district surveyors have no powers, duties or liabilities under the licences granted by the City Council. (2) Wooden structures falling within the said section 84 are works of which the district surveyor should have notice under section 145 of the said Act in a proper case. (3) The right to receive the fees for such supervision and inspection, specified in paragraph 15 of the said special case, has not lapsed, nor has it been transferred to the City Council or its officers.

Keystones.

The Tower of Westminster Cathedral is to be called St. Edward's Tower.

A New Church at King's Norton is proposed to be erected, for the Cotteridge district, of red-bricks and terra-cotta at a cost of £10,000.

Bankruptcy of a Liverpool Architect.—The public examination of William Chuck, architect, of Liverpool, was recently adjourned, no statement of affairs having been filed.

Mr. Carnegie offers Libraries to Battersea.—The Battersea Borough Council have decided to take the necessary steps to procure power to increase the local library toll from one penny to two-pence. It was stated as a reason for this that three new branch libraries were urgently needed, and that the proceeds of the present rate were insufficient to enable the council properly to remunerate their employees. Mr. Carnegie has offered to furnish £15,000 to erect the three branch library buildings if sites are furnished and the proposed legislation is effected to enable Battersea to levy a tax for maintenance of the libraries. This offer will, it is thought, enable the council to meet the necessary outlay with the proceeds of an additional halfpenny rate.

The Memorial to the late Edward Onslow Ford, E.A., to be erected in St. John's Wood, at the junction of Abbey and Grove End Roads, and within a few minutes' walk of the late sculptor's studio, will be in the form of a pedestal. One side will be adorned with a replica of the Muse at the base of the Shelley Memorial at Oxford—one of Onslow Ford's works, with which he himself was best pleased—and the other by a medallion portrait of the sculptor. The whole will be suitably protected with railings and lamp posts. The Marylebone Borough Council has already given permission to erect the memorial, the work on which has been undertaken by Mr. John W. Simpson, assisted by Mr. A. C. Lucchesi. Sir Lawrence Alma-Tadema, R.A., is chairman of the Onslow Ford Memorial Committee, the other members of which are Sir Arthur Clay, Sir E. A. Waterlow, A.R.A., P.R.W.S., Mr. George Frampton, R.A., Mr. S. Peppys Cockerell, Mr. J. M. Swan, A.R.A., Mr. Isidore Spielman, and Mr. George Simonds.

A New Wesleyan Chapel at Bispham has been built at a cost of about £1,800, from designs by Mr. T. P. Lumb.

Change of Address.—Messrs. Runtun & Barry architects, of Hull, have removed their offices from Savile Chambers to Victoria Chambers, Bowlalley Lane, Hull.

A New Methodist Church at Ince is being erected in Kettle Street, Ince. The architects are Messrs. J. B. and W. Thornley. The builder is Mr. D. A. Ablett.

A New Swimming Bath at Westminster is proposed to be erected on the site of the present Orange Street baths and washhouses, together with the adjoining site, No. 6, Long's court. A feature of the scheme is the formation of a swimming bath with a pond 60ft. by 30ft. At the present time there is no swimming bath at this establishment. It is the intention to provide a movable floor for the swimming bath. The electric light would be installed throughout, and there would be a public laundry. The cost is estimated by the city engineer and surveyor at £24,000.

A Memorial Chapel at Lancaster Parish Church is proposed to be erected on the north side, as a memorial to the officers and men who have fallen in the South African War, to be called "The King's Own Royal Lancaster Regiment Memorial Chapel." In it all the brasses and other memorials of the regiment at present in the church will be placed, and there will be five windows available for memorials. Messrs. Austin & Paley, architects, estimate that the cost will be £2,500.

New Council Offices at Horbury are being erected in Westfield Road. The ground floor will contain accommodation for the surveyor, rate collector and clerk. On the first floor there will be committee and council rooms. Also at the rear of the site, and off Manor Road, stables, sheds and workmen's building will be erected. The whole scheme, inclusive of the cost of land, will entail an expenditure of over £5,000. Messrs. Walter Hanstock & Son, Leeds and Batley, are the architects, and the following is a list of the contractors: Masons, Messrs. Henry Fallas & Son, Horbury; joiner, Mr. William Hornsall, Ossett; plumber, Mr. James Walshaw, Batley; plasterer, Mr. Henry Sanderson, Ossett; slaters, Messrs. J. Atkinson & Son, Leeds; painter, Mr. J. Hancock, Horbury; heating engineer, Mr. J. Walshaw, Batley.

A New Hospital at Pontypool is being erected on a gentle slope overlooking Pontnewynydd, southwest of Leigh Road. The external walls are to be faced with dark red Abergavenny stone, and the main groins in red Forest of Dean stone of a lighter tint. The windows and door dressings will be in Monks Park stone, of a light cream tint, and the copings in grey Doulting stone. On the ground floor will be the male ward (eight beds), female ward (eight beds), Cosslett ward for hernia cases (two beds), and accident ward (one bed), whilst on the upper floor will be the convalescent ward. The basement will contain the mortuary and fumigation chambers, these being entirely cut off from the upper parts. A coach and ambulance house and stable are also provided. The builders are Messrs. Bailey Brothers, Pontnewynydd, and the architect is Mr. Robert Williams, F.R.I.B.A., London.

Rowland Hill's Chapel.—Notices have been put in front of the Old Surrey Chapel, Blackfriars Road, that the present occupiers of the edifice—a firm of mechanical engineers—having built larger premises, the site of the chapel is for sale on a building lease. The structure itself will be demolished at an early date. The chapel was built by Rowland Hill in 1783. By direction of the founder it was constructed as an octagon, "so that," as he remarked, "the Devil could not lurk in the corners." On his death Rowland Hill was buried in its vault in 1833. The chapel remained in the hands of the Congregationalists up to the completion of Christ Church, Westminster Bridge Road, in 1876, when the congregation transferred their worship to that building. Included in the site is that of the old schools and the residence of Hill and Hall. They are at present occupied by the West Southwark Liberal and Radical Club, which has now to seek new premises.

Conway Suspension Bridge is causing anxiety owing to its defective condition.

Ripon Cathedral Reredos.—The Dean and Chapter of Ripon Cathedral recently considered a petition with reference to the hangings at the east end of the cathedral, and proposing to have prepared a design by Mr. Bodley, the eminent ecclesiastical architect, for a reredos. The Dean and Chapter accepted the offer, but the hangings will remain until the design for the reredos is submitted.

Exeter Architects' Objection to the Surveyor.—Mr. Harbottle Reed, Hon. Secretary of the Devon and Exeter Architectural Society, recently wrote to the Exeter Corporation, suggesting that the duties of the city surveyor might be so arranged that works of an architectural nature which were outside the province of the surveyor, might be entrusted to qualified members of the architectural profession. The committee were unable to recommend the council to enter into any arrangement of the kind suggested.

Proposal to Level Shakespeare Cliff, Dover.—At a recent meeting of the Dover Corporation it was stated that it was proposed to level down the noted Shakespeare Cliff, which is 300ft. high, so that the National Harbour Contractors may use the chalk for reclamation work. Sir Wollaston Knock, the town clerk, explained that he understood the proposal came from the military authorities, who stated that the range of the heavy guns at one of the new batteries was interfered with by the cliff, and the War Office therefore proposed to dismantle it. But from another source comes the assurance that no such scheme is contemplated.

"House of the Seven Gables" Competition.—It will be remembered that we offered a volume of the ARCHITECTURAL REVIEW for the best elevation and plan of Nathaniel Hawthorne's "House of the Seven Gables." One solitary drawing was sent in and this single attempt to solve the problem is merely eccentric. The plan is shown polygonal, but if the house had been so fashioned it is certain that mention would have been made of the fact. Where, one might ask, are the "passages" in this plan? Holgrove's lodging opens from the hall on the ground floor, whereas it is mentioned as being in one of the gables quite shut off from the rest of the house. And so on. We therefore feel compelled to withhold the prize.

A New Isolation Hospital at Spring Head, Meltham Moor, is being erected from designs by Mr. Joe Berry, architect, of Huddersfield. It will consist of seven blocks of buildings, giving accommodation for fifty patients, matron, nurses, servants and administration requirements. The estimated cost of the buildings, furnishing and equipment is £23,700, or about £400 per bed for each of the fifty patients. The contracts for the various works are being carried out by the following:—Messrs. A. and T. Haigh, masons, Golcar; Messrs. J. Varley & Sons, Slaithwaite, joiners; Mr. J. Kaye, plumber and glazier, Meltham; Messrs. J. Wilkinson & Sons, plasterers and slaters, Meltham; Mr. J. H. Preston, painter, Meltham; Messrs. Henry Brook & Co. ironfounders, Huddersfield; and Mr. John Cooke, concreter, Huddersfield.

At Charlton Kings Parish Church an oak screen to the new organ has been placed in the north transept. The screen has been executed by Mr. W. H. Fry, sculptor, of the London Road, Cheltenham, and it harmonises well with the reredos (also Mr. Fry's work) placed in the church last year. In the centre of the screen is a doorway supported on columns, from which springs an ogee arch, with rich cusping and carved crockets, at the base of which, on each side, are three niches, with canopies containing statues of angels symbolical of Prayer and Praise, and over these runs a carved vine string-course. From the latter rise columns supporting a groined cove, divided into nine bays, terminating against the panelled wings on each side. On the upper cornice is an inscription, and immediately over it is a carved string-course of Gothic lilies, interspersed with shields. The screen is 16ft. long by 12ft., and is surmounted by a brattishing. A new brass handrail, filled in with hammered-iron scrollwork, has also been fixed to the pulpit. This was the work of Messrs. Hancock & Son, of Bennington Street, Cheltenham.

THE KING'S SANATORIUM.

THE Advisory Committee appointed by the King in connection with the erection of a sanatorium for tuberculosis in England announce that 180 essays were sent in competition for the three prizes sanctioned by his Majesty. The Advisory Committee, consisting of Sir W. Broadbent, Sir R. Douglas Powell, Sir Felix Semon, Sir Herman Weber and Dr. Theodore Williams, were unanimous that the following essays were the best, and the "Lancet" reports that, with the approval of his Majesty, the prizes have been awarded in the order mentioned:—

1st Prize: Dr. Arthur Latham (London), with whom is associated as architect Mr. William West (London).

2nd Prize: Dr. F. J. Wethered (London), with whom are associated as architects Messrs. Law & Allen (London).

3rd Prize: Dr. E. C. Morland (Croydon), with whom is associated as architect Mr. G. Morland (Croydon).

The following are awarded honourable mention:—

Dr. P. S. Hichens (Northampton), with whom is associated as architect Mr. R. W. Schultz (London).

Dr. Turban (Davos), with whom is associated as architect Herr J. Gros (Zurich).

Dr. Jane Walker (London), with whom are associated as architects Messrs. Smith & Brewer (London).

Dr. J. P. Wills (Bexhill), with whom is associated as architect Mr. Wills (London).

SHALDON'S NEW CHURCH.

A NEW church at Shaldon has been completed. It was commenced in 1899. The church is situated at the end of the long bridge that unites Teignmouth to Shaldon. It measures internally 128ft from east to west, with a clear breadth of 45ft. The ceilings of nave and chancel are of cradle form, built in panels of blue stone, divided by broad ribs, which are to be eventually carved. The crown of the vault is 38ft. from the floor. The north and south aisles are roofed over with the same material in the form of a continuous half arch from the chancel to the west end. These ceilings are divided up into panels in the same manner as the nave, but on a smaller scale. At the east end of the aisle is the lady chapel, with its narrow aisle separated from its nave by twin lofty arches. These ceilings are also built in stone. Both the east ends of chancel and lady

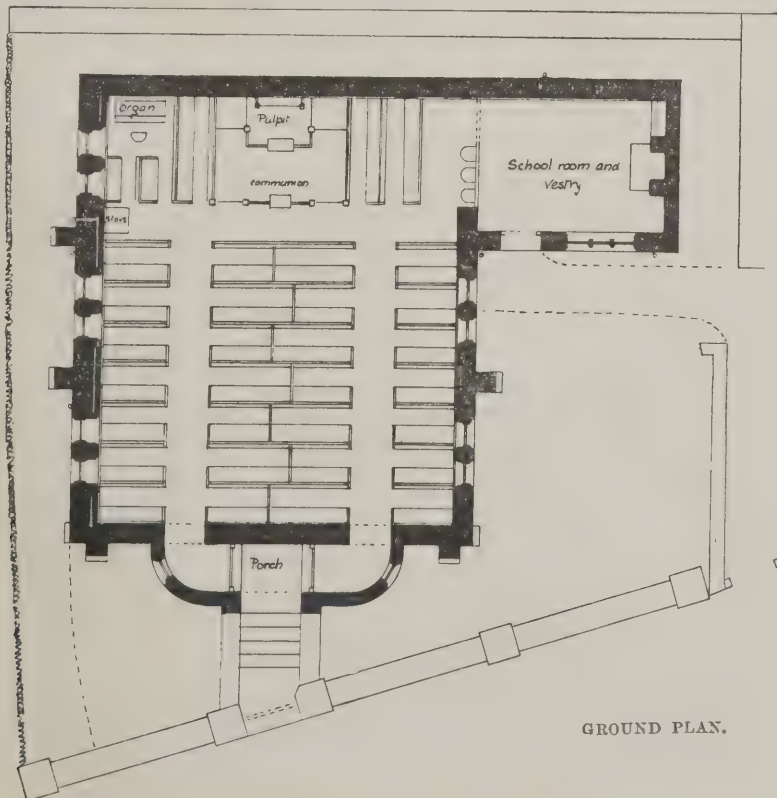
chapel are apsidal. The north aisle terminates with the vestries and organ-chamber. The pavements of the chancel and lady chapel consist of various marbles from Devon, Italy and Africa. The altar rails to both altars are of carved alabaster. The chancel is separated from

the nave by a large stone-traceried screen. On the cornice stand five figures in Penkridge stone. Five feet above the cornice of the screen a band of wrought ironwork stretches across the church. The summit of the Cross is 30ft. from the floor. The large west window rests on a bold arch, spanning the nave, about 10ft. above the floor. The 8ft. recess from this arch to the west wall forms the baptistery, the font consisting of a youthful figure of St. John the Baptist holding out a shell. Externally the west window is seen recessed as the nave roof is carried beyond the line of the window, and is supported by an open arch resting on two piers 6ft. wide, and which rest on the low west wall. At the sides of the arch are flying buttresses, with open tracery. The tracery of the west window is a feature in the church. Six flying buttresses on each side of the building help to support the thrust of the nave ceiling. There is a large niche or pinnacle over each buttress, resting on the clearstory walls. The roofs are covered with Welsh slates. The four massive buttresses at the east end are surmounted by pinnacle work. The various kinds of stone used in the building are the local red rock, Bath, Portland, Polyphant, Bath and Bere. The church has cost about £10,000, and the whole work has been designed and superintended by Mr. Edmund Sedding, F.R.I.B.A., of Plymouth.

Memorial Chapel, Dolanog.—This building, situated in the hills of Montgomeryshire, is being erected in memory of Ann Griffith, the greatest of Welsh hymnologists. It is built of local blue stone with Cefn stone dressings. The roof, which is of hammer-beam construction, and the stone corbels carrying the principals, are carved with heads of some of the notable preachers connected with the denomination in the neighbourhood. In the rostrum are placed tapestry panels depicting scenes in the life of Ann Griffith. The architect is Mr. G. Dickens-Lewis of Shrewsbury, and the contract for the building has been let to Mr. W. H. Thomas, of Oswestry.



MEMORIAL CHAPEL, DOLANOG, NORTH WALES. G. DICKENS-LEWIS, ARCHITECT.



GROUND PLAN.

THE LATEST ROWTON HOUSE.

ROWTON HOUSE, Fieldgate Street, Whitechapel, is the fifth of a series of "Poor Men's Hotels" known as "Rowton Houses," the property of Rowton Houses, Ltd. The first, situated at Vauxhall, opened in 1893, has 475 cubicles; the second, in King's Cross Road, opened in 1895, has 677 cubicles; the third, at Newington Butts, opened in 1897, has 805 cubicles; the fourth, at Hammersmith, has 800 cubicles; and the present building 816 cubicles. Like the others, it was designed by Mr. H. B. Measures, F.R.I.B.A., the company's architect, Mr. G. J. Earle being the surveyor.

The site consists of two adjoining parallelograms, the larger of which faces Fieldgate Street and has a frontage of 192ft. with a depth of 129ft., while the smaller has a back frontage of 75ft. and a depth of 67ft., with a total superficial area of 29,500ft. An abundance of light and air on all floors has been secured by the provision of wide forecourts on all sides of building, and in addition a large inner courtyard 50ft. wide open at its eastern end.

Advantage has been taken of the large area of the site to place all the day-rooms used by lodgers (with the exception of the reading-room) on the ground floor.

The elevations have been erected in pressed Leicester facing-bricks, relieved with Fletton bricks and dressings of pinky-buff terra-cotta from Mr. J. C. Edwards, Ruabon. The whole of the interior walling, excepting where glazed bricks are used, is built with Fletton bricks. All brickwork throughout the building has been built in Portland-cement mortar. The roofs to the front elevations are covered with green slates, nailed direct upon coke-breeze concrete slabs, carried upon steel construction; all other roofs are flat, concrete and steel construction, covered with asphalt. The site is covered with a thick bed of concrete upon which, where wooden floors are laid, are solid oak wood blocks, and to other floors cement and granite chippings. The floors are fireproof throughout, formed of concrete and steel, and the staircases and landings are in Portland-cement concrete. To avoid a cavity between the surface of the concrete and the flooring, the floorboards are nailed directly upon the concrete to cubicle floors. Special care has

been exercised in the planning and execution of all the sanitary work, both in the portion underground and the plumber's work. Access is immediately obtainable to any portion of the underground work by the placing of inspection manholes at every change in direction of pipes and in positions that enable all junctions to be easily accessible. Iron pipes with coated interiors are used wherever it has been necessary to carry them under the building.

A system of electric lighting has been adopted giving the official on each floor of cubicles control of the lights upon that floor; the various rooms on basement and ground floors are controlled separately, one from another, and, in addition, the superintendent has complete control, in the office and meter-room, over all the various sections. Meters are placed on each section so that any excessive use of the lighting may be traced.

The building is divided for administrative purposes into five sections:—(1) Superintendent's apartment, with separate accommodation for office clerk; (2) bed-makers; (3) catering section, which includes sleeping accommodation for females employed in shop, kitchen and scullery; (4) lodgers' day-rooms and (5) lodgers' cubicles.

The kitchen (on the ground floor) measures 29ft. by 20ft., and is built in glazed brickwork from floor to ceiling, floor laid with wood blocks having quarry-tiled margin and hearths. The scullery is 27ft. by 22ft., and the larder 15ft. 6in. by 8ft., with slate and wood shelving and rails and hooks for hanging joints, &c.

Service Lobbies.—Service lobbies are formed between shop, kitchen, scullery and larder. All walls are in glazed brickwork.

Stores.—Large store rooms, fitted up with shelving, &c., are provided for storage of groceries and other goods for catering purposes; another store-room, in passage outside kitchen, is fitted up for and stocked with spare crockery, &c.

Kitchen Servants.—A corridor, built in glazed brickwork, gives access to a sitting-room and six bedrooms, bathroom, lavatory and w.c. for the use of female staff employed in the catering department.

The smoking-room on the ground floor has a floor space of 1,936ft. The tables and seats are of teak as in the dining-room, and, as fitted, seat 140 lodgers. Glazed faience mantels and over-

mantels are provided and fitted for large open fires. The walls are built with a high dado of cream and chocolate-tinted glazed brickwork, with plastering above tinted to a shade of terra-cotta.

The reading-room is placed on the first floor with staircase approach from the entrance corridor, and has similar bays to those in smoking-room; the floor area is 2,442ft. A large portion of the wall space is occupied by a series of panels emblematic of "The Seasons," painted by Mr. H. F. Strachey, of Stoney Mead, Clutton, near Bristol, and have been most generously presented to Rowton House as a practical demonstration of the interest taken by the artist in the elevating work of the house.

The dining-room on the ground floor has large ventilating top lights into the central courtyard of the building, in addition to large windows. The floor space provided in this room is 5,891ft.; seating is arranged at tables for 456 men, and in addition a number of extra seats and wooden easy chairs are provided. The walls are built with a high dado of cream and chocolate-tinted glazed brickwork, with plastering above tinted to a shade of terra-cotta. Four large cooking ranges, with ovens, hot plates and grills, are provided out of the line of traffic in each part of the room; large boilers at the back of these provide a supply of boiling water for lodgers for cooking, tea, &c.

A large space adjoining the dining-room has been divided up into seven corridors, top-lighted and ventilated, fitted with lockers. The lockers, over 800 in number, are uniform in size, 3ft. high by 1ft. 6in. square inside, fitted with shelf and lock; each ventilated and numbered. These are arranged in tiers, three in height; provision is made in them for sticks or umbrellas.

The lavatory is between the two eastern staircases, entered from the main corridor at one end and the north-east staircase corridor at the other; it is 38ft. wide by 40ft. long, and has a French grey and ivory dado, with ivory walls and moulded cornices above same—all in glazed brickwork. There are 80 lavatory basins of white enamelled fireclay, fitted up with polished slate top, brass taps for hot- and cold-water supply to each basin, towel and hat rails. The waste pipes from each lavatory are discharged over an open



ROWTON HOUSE, FIELDGATE STREET, WHITECHAPEL: THE LAVATORY. H. B. MEASURES, F.R.I.B.A., ARCHITECT.

white enamelled earthenware channel in floor, and the flooring is laid with falls to this channel throughout for cleansing and speedy drying. The hot-water pipes are exposed so that the radiated heat may be utilised for warming the lavatory.

A room is fitted up for feet washing with eleven deep foot-washing troughs, with teak boards between each, and hot and cold supply carried to each trough. Walls, glazed brick-work. Seven bathrooms are provided, as well as numerous other rooms which cannot now be described.

The cubicles are approached by three fire-proof staircases, built in ivory-glazed brickwork, two situated at the eastern boundary of the site—one adjoining office, and all at the extreme ends of cubicle corridors. The disposition of the staircases renders it an impossibility for the lodgers to be trapped by fire in the event of an outbreak, as the cubicle corridors run from staircase to staircase, thereby leaving open a way for retreat in the event of access to one staircase being blocked. In addition, each floor is divided by divisional walls into ten sections, which would check, if not stop, the progress of a fire horizontally. The sectioning of floors also enables isolation and efficient fumigation in the event of a case of contagious disease.

There are five floors of cubicles, with a total sleeping accommodation for 816 men; each bed is in a separate cubicle, and every cubicle in the building has a window under the control of the occupant. The portion of the cubicle partition next to the corridor is 6ft. 6in. high, while the divisions dividing the cubicles are 7ft. 6in., leaving a space, up to ceiling level, free for ventilation. Two w.c.'s and a sink with cold-water drinking supply are placed on each of the eastern staircase landings outside entrance to cubicles, thus providing w.c.'s and sinks on each floor for night use. The charge for a cubicle, with the use of day-rooms, lavatories, and other conveniences, is 6d. per night.

PERSIAN TILES.

THE production of glazed and enamelled tiles and bricks in Persia dates back to such remote antiquity that there is no record of its commencement. Many fine specimens have been found in excavations of Babylonian and Persian cities, and several museums possess valuable collections of these. Many of these ancient tiles have their decorations complete, each in itself, like our ordinary tiles of to-day, but others form parts of extended designs. A beautiful example of this is to be seen in the museum of the Louvre at Paris. This is a complete panel from the ruins of the palace of Artaxerxes Mnemon, a Persian potentate who reigned about 400 B.C. The panel consists of about 190 tiles, bricks or blocks, whatever we may choose to call them, for each is 14in. long, 8in. wide and 7in. thick. The panel was originally on the upper part of a wall of the palace, and the decorated wall was from a half to three-quarters of a mile in length. The panel at the museum shows two lions in low relief, beautifully executed. Forty-eight of the tiles or bricks go to form one of the lions. The colours, though fired 2,300 years ago, are still beautiful and bright.

Tiles of the older times are softer and smoother than those of later date. The work of the thirteenth and fourteenth centuries of our era is harder, and it is more frequently in relief. The material of the body was excellent and was evidently most carefully prepared and selected. The delicacy of execution, the beauty of the colouring and the excellence of the enamel make these tiles, both the very ancient and those of later date, models worthy of our emulation to-day. The secrets alike of the body, the colouring and the glaze are lost; and though attempts have been made both in Europe and in Persia to reproduce the effects of ancient tiles, they have so far not met with success. The body of the tiles in the Louvre appears to be a white clay, but we could not learn that any attempt had been made to analyse it.

In early Persian days man's efforts at decoration had to be devoted principally to the palaces of the rulers. In later times, as in our own history, the clerical power became greater than



ROWTON HOUSE, FIELDGATE STREET, WHITECHAPEL: CUBICLES.
H. B. MEASURES, F.R.I.B.A., ARCHITECT.

the regal, and the Persian tiles of the thirteenth and fifteenth centuries A.D. were principally used in mosques, tombs and other holy places. The designs, due to the influence of the Mohammedan faith, which now dominates, were mostly conventional, floral and geometrical, but it must be remembered that the Persians, being of the Shiite sect of Mohammedans, were not so strict in regard to representing animal forms. In Persian arabesque decorations we may occasionally see animal figures, notwithstanding the injunction in the Koran never to make any representation of a human or animal figure.

In the old tiles the ground is usually of a golden colour, sometimes shaded with blue, giving great delicacy to the designs. This is an effect which has been industriously sought after by modern ceramists, but without success. The art was lost in the constant wars of invasion and extermination, which left none of the original inhabitants. The ordinary domestic ware was of the same kind of material, and had the same fine glaze and colour tones. Specimens of this ware are highly prized by collectors.

The manufacture of tiles is carried on in Persia at the present day. They are used chiefly as decorations of mosques and monuments, and are made both as wall and floor tiles. They are made in thicknesses varying from $\frac{1}{2}$ in. to 3 in.

The arabesque designs are very good and thoroughly Oriental.

The material of the body of the modern ware is nine-tenths pulverised quartz and one-tenth of a very plastic clay. The glaze is made from sand and potash, both very plentiful materials in Persia.

The modern Persian tiles, though not equal to the ancient ones, are still very beautiful, and there is no doubt they would find a ready market in Europe and America but for the difficulty and costliness of transportation in Persia. The freight alone, without commission or duties, from Teheran, the capital, to the nearest seaport is £16 per ton. When we examine the methods of manufacture we find them astounding. For tools and machines there is nothing but a pestle and a mortar and a common knife, while the workshops are simple mud hovels. The firing is done in small square kilns, with wood fuel, and both up and down draught are used.—(From the "Clayworker" of Indianapolis, U.S.A.)

An Architectural Congress was opened in connection with the Exhibition of Ancient Flemish Art at Bruges on Monday, August 11th, and will end on August 14th. A number of interesting papers are being read and discussed.

ST. MARK'S CAMPANILE.

Its Preservation with Cement Grouting.

IN a letter to the "Times" Mr. Edwin Durning-Lawrence says:—It seems now to be demonstrated that the cause of the collapse of the Campanile of St. Mark's was that the materials of which it was composed had by the lapse of time lost their coherence, so that the whole was little better than a mass of dry dust. Some persons are persuaded that it would have been an impossible task to have rendered this grand old tower once more safe and strong and able to endure for another 1,000 years. This is, however, a mistaken view, as it would have been perfectly easy and even cheap to have made the structure so strong and, perhaps, even stronger than when first erected.

Any tower of masonry which is fairly upright and the foundations of which are not hopelessly irreparable can be rendered strong and safe, as the Campanile could have been rendered strong and safe, by the simple process of drilling holes about 4 in. in diameter nearly through the masonry (masonry includes brickwork) and pumping into the structure Portland-cement grouting. The holes should be about 3 ft. apart, and commence at the bottom. It is generally possible to do this work from the inside so that the facework is not in any way disfigured. In the case of the perished Campanile about eight or ten thousand such holes would have been required, and these should have been cut or drilled at the rate of about fifteen or twenty a day, commencing at the bottom of the tower, the Portland-cement grouting being pumped into the holes each day as the work proceeded. The whole process would thus have occupied about two years, the labour on each hole for drilling and filling costing about 3 francs, or half-a-crown. About 400 or 500 tons of Portland cement would have been required, say, £1,500 to £2,000; superintendence and further repairs to stonework and contingencies about a further £2,000; so that £5,000 would probably have perfectly restored the whole.

Treated by this method the Campanile would perhaps have been considerably stronger and more durable than when first erected. An old brick, which is scarcely more than a mass of dry dust, becomes hard and strong when it has absorbed Portland-cement grouting, while the mere dry rubbish in the centre of the walling forms a solid mass of Portland-cement concrete as hard, solid and durable as the best natural rock.

The process is exceedingly safe, simple and easy, and only two precautions are necessary, viz., not to proceed too rapidly with the work, and to take care that the Portland cement selected is of good quality and has been what is technically called "killed"—i.e., exposed to the air on a barn floor for some two months before being used as grouting in order that it may not expand—or "blow," as it is called—after it has been pumped into the walling. Nearly any masonry structures and most natural rocks can be rendered permanently strong by this simple process of pumping into them a grout of Portland cement, which is now being largely used by engineers in various parts of the world.

Other Venetian Churches in Danger.

It is stated that the King of Italy has contributed the sum of 100,000 lire to the fund for the restoration of the Campanile.

The neglect of the Government to keep the Venetian monuments in proper repair is causing much bad feeling among the citizens. There was recently a panic in the church of San Giovanni Paolo, owing to the fall of the capital of one of the small columns from the famous Vivarini painted glass window over the right side gate called "dei morti." The window will be repaired at once and scaffolding is already erected. On inspection some cracks and fissures were found on the walls. A gate in the sacristy, the stuccos of the "Addolorata" Chapel, and some monuments, chiefly that of Valier and Bragadin, require urgent repairs. Although the commission declared that there was no danger of the church collapsing, the Venetians are naturally anxious that it should be kept in perfect order, for, besides other prominent monuments and works of art, the church contains the remains of twenty-one Doges and is con-

sidered as a Venetian Pantheon. Repairs and works for strengthening the bell towers and churches of San Francesco della Vigna and San Giobbe have been ordered.

New, True or Neither.

The "Westminster Gazette" can vouch for the absolute inaccuracy of the following facts, communicated by a thoroughly untrustworthy correspondent:—

The proprietors of Peter Piper's Patent Pepper have telegraphed to the Syndic of Venice that they will defray the whole cost of rebuilding the brickwork of the Campanile, on condition that the bricks are glazed, are sky-blue and orange in colour, and are arranged so as to show on the four sides, in gigantic letters, one above the other, the words "Peter Piper's Patent Pepper."

A well-known American millionaire has offered to reconstruct the whole of the Campanile, provided that the new structure is entirely of American steel, covered with stucco to imitate the old brick and stone, and that it contains an American elevator and an American bar. Also that flash-light advertisements of American steamships are displayed immediately below the roof.

Mr. Akers-Douglas, fearing that changes in the Cabinet might deprive him of occupation, offered his services to the Municipality to superintend the rebuilding of the Campanile, and forwarded excellent testimonials, highly commending the Record Office, the altered designs for the new Government buildings in Whitehall, the widening of the widest part of Piccadilly, and other achievements, from the Office of Works and the Kentish Hop-growers' Association. He received the following answer: "*La ringrazio infinitamente, impossibile, Sindaco.*" Presuming this telegram to be in Italian, a language which he does not understand, he showed it to Lord Cranborne, as one well acquainted with foreign affairs. The Under-Secretary said he thought it was in German, but it was all the same to him, as he could only speak English, and that not to the satisfaction of everyone. Mr. Akers-Douglas then showed it to Mr. Chamberlain, who has travelled in Italy and Malta. The Colonial Secretary was very busy; but he sent for Mr. Austen Chamberlain and a dictionary, and gave the translation as "No," which Mr. Akers-Douglas feels sure is more abrupt than the original.

The Royal Academy of Arts, following the suggestion of the Editor of the "Times," resolved to open a subscription towards the cost of the rebuilding. The Council of the Academy requested Sir W. Richmond, who is stated to be a great authority on the preservation, restoration and decoration of ancient buildings, to collect money for this purpose. Sir William agreed to do so on condition that he designed the new Campanile. At the same time he produced a very flattering testimonial from the Dean of St. Paul's, who subscribed five shillings.

The Council then met again, and proposed that Sir Lawrence Alma-Tadema should collect the money. At this moment the Dean of St. Paul's managed to get in, and demanded the return of his subscription. The Council offered him five copies of this year's catalogue, but in vain. Eventually Sir W. Richmond was found inspecting a smoky chimney in Hammersmith, and explained that he had already spent the five shillings for that purpose, with a view to the ultimate preservation from soot of the decorations in St. Paul's. The Dean expressed his profound gratification that the money should have been devoted to this much more praiseworthy object, and left urging the Academy to support it.

Sir Lawrence Alma-Tadema was then understood to say that he would collect subscriptions, and expressed an opinion that the lower part of the Campanile ought to be of marble. He would be willing to remedy this defect by painting, which was a speciality of his, provided that he could add the words "He found it brick and left it marble." Sir W. Richmond here interrupted, and said Sir Lawrence might know something about marbling, but he knew nothing whatever about mosaics, colour decoration, stencilling, painting, sculpture, architecture, collecting subscriptions, or smoke prevention. Sir Lawrence was understood to make

some jesting reply, and the Council adjourned without coming to any decision. The Academy subscription is therefore not yet opened.

The Work of Sifting and Sorting.

No better newspaper reports relating to the Campanile have been published than those by Mr. A. Robertson in the "Scotsman." We learn from this source that the sifting and separation and removal of the 18,000 tons of debris goes on apace day by day from 5.30 in the morning till 7.30 in the evening. The useless material is taken out into the Adriatic Gulf, but the marbles and bricks are taken to the islands of San Giorgio Maggiore and Delle Grazie, the most precious of them being taken into the quadrangle of the Doge's Palace, or into the office of Commendatore Boni.

The four bronze statues—Apollo, Minerva, Pallas and Pallas—that stood in niches on the front of Sansovino's loggetta have all been found, and though Apollo is broken most, the head, legs and hands being severed from the trunk, all can still be put together again.

Commendatore Boni does not think that the foundations of the Campanile have been at all injured, but in any case he will enlarge them, as they were not laid down at first to carry such a high and weighty tower as the Campanile was. At present they cover 200 sq. metres; he purposes enlarging them to cover 400. Money is coming in for the rebuilding more slowly than at first, but steadily.

Report of the Commission.

To pass now to the report of the "Commission for the Inspection of Venice Monuments." The fall of the Campanile suggested the thought that other towers and buildings might be in an unsatisfactory state, which has unfortunately proved to be the case.

The Doge's Palace.—The Commission is not aware that any thing new threatens its stability, but the weight of the books of the Marciana Library must be removed.

The Procuratie Vecchie.—In this building, which forms the north side of the Piazza of St. Mark, the whole of the internal arrangements have been altered to meet the needs of trade and commerce. Besides which tons on tons of goods, a large part of which consists of glass, are stored there. Consequently cracks have appeared, and though there is no danger of collapse, still work of restoration is urgently needed. Signor Boni said he should like to see the buildings turned into dwelling-houses, thus restoring them in great part to their original use.

The Campanile of S. Stefano.—The upper half of this campanile was rebuilt after the destruction caused by lightning in 1585, but it is precisely this part that now threatens to fall. It is nearly 6 ft. out of plumb. Signor Boni has therefore ordered the demolition of the newer upper half.

The Campanile of S. Barnabas.—Near the base of this campanile cracks and bulgings have been discovered. The Commission have, therefore, ordered the cessation of the ringing of its bells and they contemplate immediate repairs.

The Campanile of San Francesco della Vigna.—The Commission finds that this campanile needs strengthening. Its bells, too, have been ordered to be quiet. Signor Boni says it may have been built too near the banks of some old canal.

The Bell-Tower of the Arsenal, in which hung the modern "Maraugona" that called the workers to their labours, has been condemned to undergo repairs. The bell has been swung to the top-mast of a ship, and meantime does duty there.

The Church of Mater Domini is dark, and low and dismal, and the Commission report it to be in a positively deplorable condition. It will have to be closed and thoroughly overhauled and restored.

The Church of the Maricoli, considered to be one of the most beautiful Renaissance churches in Italy, has been ordered to be closed so that the necessary work may be done to preserve it.

Lastly, as might be expected, the Ghetto has called the attention of the Commission, and some of the houses have been condemned.

Builders' Notes.

Mr. Henry C. Ffello, contractor and builder, of Northfleet, died recently at the age of fifty-four years.

The late **Mr. William Fassnidge**, of The Cedars, Uxbridge, builder and contractor, left an estate which has been valued at £60,658 16s. 3d. gross.

"**The Decorator**" is a new monthly magazine for house painters, decorators and others, published on the 15th of each month, price 6d. Office: 365, Birkbeck Bank Chambers, High Holborn, London, W.C.

Lord Penrhyn and His Workmen.—The workmen employed at the Penrhyn quarry recently passed a resolution thanking Lord Penrhyn for his kindness towards them on the occasion of the Coronation by granting a holiday in the quarry, and especially for giving an additional 5 per cent. on their wages for the month as a celebration of the event.

A New Skylight for Corrugated Iron Buildings has been introduced by the Edwin Verity Manufacturing Co., of Briggate, Leeds. It is of cast-iron with the ends of its frame corrugated to fit snugly on the roof. Fixing is as easy as an ordinary sheet. The skylight can be opened by hand simply or, where it is out of reach, is fitted with Verity's patent rackwork opening gear. At present the skylight is made in only one size (3ft. by 18in. light) with 3in. corrugations. Its price is 7s. 6d. for a dead light; 12s. to open by hand; 25s. with opening gear.

Engineering Notes.

Water-Supply for Battersea Baths.—After many experiments and not a few disappointments the local authorities at Battersea have succeeded in obtaining a supply of water for the public baths in Latchmere Road, which, it is hoped, will render them independent of the water companies. Two artesian wells have been sunk, and it is computed that 1,152,000 gals. per week will be obtained. The total consumption of water per annum is 20,700,000 gals., for which hitherto £577 10s. per annum has been paid, as against £172 10s. under the new system. The total cost of the work and plant has been £4,442.

The Electric Railway from St. Gervais to Chamonix, which was opened a year ago by the P.L.M. Company, is a triumph of engineering skill. In spite of the fact that it rises more than 1,500ft. in about 12 miles, it does not employ the rack-and-pinion system which is in use in the Visp-Zermatt line, but relies upon adhesion alone, supported by three very powerful brakes. It takes less than a third of the time occupied by the old diligence, while at the same time it gives passengers a far better opportunity of enjoying the magnificent views that are to be obtained in ascending the valley of the Arve.

Ventilation of the House of Commons.—The first report of the Select Committee on the Ventilation of the House of Commons has just been issued. It states that the committee have held ten meetings and examined witnesses on the best means of effecting such improvements in the ventilation as might be desirable. They have also caused chemical and bacteriological tests to be applied to the atmosphere in the debating Chamber and other parts of the House. At the present stage of their enquiry the committee are not prepared with definite recommendations, nor can they yet state the conclusions to be arrived at on the experiments made on the air, beyond saying that the general results, so far as the debating Chamber itself is concerned, are good. The state of some of the committee-rooms, smoking-rooms, &c., is by no means satisfactory.

A New Overhead Bridge at Liverpool has been constructed connecting the landing-stage and liners alongside with Riverside Station. The bridge is part of the overhead platform scheme inaugurated a good while since. Atlantic passengers will now walk from the deck of the steamer, however high, on to the platform, and thence through the bridge on a level with the steamer to the Riverside Station. The bridge (116ft. 6in. in length) is made of steel, and

weighs sixty tons. It has been constructed piecemeal on the spot by Messrs. Heenan & Froude, of Newton Heath Ironworks. It was constructed on piles temporarily driven into the bed of the river. When the tide rose the water-side end of the bridge—the landside end being already fast—resting on the landing-stage was lifted with the rise of the water. As soon as the bridge was clear of the piles these were promptly knocked down into the river. As the tide began to fall away the bridge was adjusted into its proper position and securely fixed. The demolition of the temporary construction was effected in about an hour and a half, so that at low water very little of it was left, and the new bridge securely built occupied its place.

The Baker Street and Waterloo Railway is nearing completion, for there is in all about six miles of single tunnel, of which only a little over 1½ miles remain to be constructed. At the stations the lift shafts have been completed at Waterloo, Piccadilly Circus and Baker Street, and are about to be commenced at Oxford Circus. Staircase shafts at Waterloo and Oxford Circus have been sunk. The booking hall at Waterloo has been covered in, and is ready for the internal fittings. All the land for the station sites from Baker Street to the dépôt in St. George's Circus has been arranged for, and the company is in possession except at Trafalgar Square, and here possession will shortly be obtained and the work started.

The North Pier, Blackpool, is being extended at a cost of £20,000. The pier entrance is to be set back 60ft., the whole of the present erections removed, and a 100ft. added to the frontage of the new entrances. A series of buildings and offices will be erected. In the new entrance area an arcade and shelter are to be built, with arched roof, clearstory windows, top lantern and ornamental corner cupolas. The whole of the new substructure is expected to be finished by the end of the year, and Messrs. J. Butler & Co.'s Trustees, Stanningly Ironworks, Leeds, have the work now in hand. Mr. Thomas Dryden, engineer, of Preston, is superintending the work. At present the piles for the foundations are being screwed in. The piles are each 8ft. long, and will be surmounted by intermediate columns 26ft. long. On top of these will be columns 10ft. long, with brackets for the girder-work. Lattice girders with rose centres will be introduced, but the main building will be carried by solid riveted girders 31in. deep. The principal piles will be protected by wooden fenders. The work of setting back the pier entrance for the Promenade widening cannot commence before October 7th, and must be completed fourteen days before next Easter Sunday. The contract for the superstructure will be let next month, and it is expected that the demolition of the present shops and entrance buildings will be commenced in October. By next season it is hoped that the whole work will be completed. The architects for the superstructure are Messrs. Maxwell & Tuke, of Manchester.

COMING EVENTS.

Wednesday, August 13.

ART CONGRESS AT BRUGES in connection with the Exposition des Primitifs Flamands. Third Day. INSTITUTE OF SANITARY ENGINEERS.—Meetings of the General Purposes and Finance Committee at 4 p.m., of Examination and Literary Committee at 4 p.m., of Election Committee at 5.15 p.m., and of Council at 7 p.m.

Thursday, August 14.

ART CONGRESS AT BRUGES.—Fourth Day.

Saturday, August 16.

ARCHITECTURAL ASSOCIATION.—Fourth Summer Visit to Fooks Cray Place and Church.

Saturday, August 23.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Hartlepool.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Visit to Rickmansworth.

Sir Benjamin Stone's Collection of Photographs, including historical and architectural subjects, was lent by the Board of Education to the Birmingham Photographic Society for their recent annual exhibition. The "Birmingham Magazine of Arts and Industries" states that this is the first time the collection has been exhibited in the provinces.

New Companies.

Chaddock Window and Bulkhead Door Syndicate, Ltd.

Registered to adopt an agreement made by this company with G. A. Chaddock for the acquisition of certain patents relating to improvements in openings made to facilitate inter-communication through bulkheads; also as window and door manufacturers, &c. Capital £4,000 in £1 shares.

Estates and Commercial Syndicate, Ltd.

Registered to develop the resources of land and to act as builders and contractors, &c. Capital £5,000 in £1 shares. Registered office: 19 and 21, Queen Victoria Street, E.C.

Garden City Pioneer Co., Ltd.

Registered to promote and further the distribution of the industrial population upon the land, as suggested in Mr. Ebenezer Howard's "Garden Cities of To-morrow," and to carry on the general business of a land development company. Capital £20,000 in £1 shares.

Coston & Co., Ltd.

Registered to acquire the business carried on by W. H. B. Coston as Coston & Co., at 14, Millbrook Road and Grove Road, Southampton, and to carry on the general business of builders and contractors, &c. Capital £6,000 in £1 shares. Registered office: 14, Millbrook Road, Southampton.

Sutton District Development Co., Ltd.

Registered to carry on the general business of a land development company; as builders and contractors, dealers in all kinds of building materials, brick, tile, and terra-cotta makers, &c. Capital £1,000 in £1 shares.

Vron Welsh Slate Quarries, Ltd.

Registered to acquire certain slate and stone quarries known as the Vron and Old Braich properties, Llandwrog, Carnarvon, and forming part of the waste lands belonging to his Majesty, and to work the same; to erect machinery, construct and maintain rail and tram roads; as slate and stone merchants; to acquire and turn to account any other land and estates, buildings and other conveniences for the purposes of the company. Capital £2,000 in £25 shares. Registered office: Slate Quarry, Carnarvon.

Burma Tramways Construction Co., Ltd.

Registered to construct, maintain and work any rail and tramroads, and also undertakings of every kind for generation, utilisation, supply or distribution of electrical or other power for heating, lighting, telegraphic or telephonic purposes, &c. Capital £50,000 in £10 shares.

E. W. Turner & Co., Ltd.

Registered to acquire the business of E. W. Turner, of Bloxwich, Staffordshire, and to carry on business as timber growers, merchants, factors, benders and sawyers, saw-mill proprietors, valuers, and agents, mahogany and veneer merchants, lath-renders, dealers in railway and pit sleepers and pit props; as builders' merchants, sanitary engineers, &c. Capital £15,000 in £5 shares.

Properties and Land Development Co., Ltd.

Registered to acquire to deal with and turn to account any real or personal property; to erect any buildings, works, factories and other conveniences. Capital £10,100 in 1,000 £10 preference shares and 2,000 1s. ordinary shares. Registered office: 33, Southampton Street, W.C.

Hinton, Perry & Davenhill, Ltd.

Registered to acquire the business now carried on at Pensnett, Staffordshire, as Hinton & Perry, and also the undertaking of the Staffordshire Red and Blue Brickworks, and to carry on business as manufacturers of red and blue bricks, fire and glazed bricks and tiles and terra-cotta goods, pottery, earthenware and clay goods of all kinds; as lime-burners and merchants. Capital £8,000 in £1 shares. Registered office: Shut end, Pensnett, South Staffordshire.

TENDERS.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Eppingham House, Arundel Street, Strand, W.C.

BISHOP AUCKLAND.—For the erection of 200 workmen's and agents' houses upon land situate midway between Coundon and Messrs. Bolckow, Vaughan, & Co.'s Lessingthorne Colliery, near Bishop Auckland, in the county of Durham. Mr. I. A. Derwent, architect, 19 Danesbury Terrace, Darlington:—

Glen & Moffett, Napier Street, Darrow	£47,748 12 7
W. Oates & Son, Croft	44,955 0 0
Scott & Co., Gray's Siding, Elizabeth Street, Newcastle-on-Tyne	44,065 10 0
H. Peverell, Main Street, South Church	44,293 10 0
Walton Bros., Croft Street, Crook	45,300 0 0
T. Manners, Peel Street, Bishop Auckland	42,660 0 0
Pickup & Bell, 103 Hollingreave Road, Burnley	42,442 17 6
C. Wright, Park Road, West Hartlepool	42,224 0 0
J. Hutchinson, East Boldon, near Newcastle	40,460 10 0
W. Foster, Pelaw-on-Tyne	40,344 15 0
T. Atkinson, Albert View, Coundon	38,057 0 0
G. Wells, Harton, South Shields	38,451 0 0
R. Dunn, Crozier House, Shildon	34,063 8 0
Ward Bros. & Lewis, 21 Granville Road, Middlesbrough	31,375 0 0

* Accepted.

BRISTOL.—For proposed additions to Victoria Factory, Outlands Common, near Bristol, for Messrs. C. Bayer & Co. Mr. Frederick W. Gardiner, architect, Bath:—

W. Church	£2,960	Hayward & Wooster	£2,443
Erwood & Morris	2,870	Chancellor & Sons	2,387
Howard & Sons	2,878	W. Webb	2,382
Wills & Sons	2,849	Adams & Jefferies, Bristol	2,305
A. J. Beaven	2,590		* Accepted.

BRISTOL.—For extension of the docks offices, Queen Square, for the Bristol Docks Committee. Mr. W. V. Gough, architect, 24 Bridge Street, Bristol:—

J. Perkins	£3,330	G. Downs & Son	£2,095
W. Cowlin & Son	3,310	C. Humphreys	2,067
E. Walters	3,160	J. Ridd	2,069
W. Church, Wapping	3,128	C. A. Hayes, Thomas Eastbrook & Sons	3,087

* Accepted.

CARLTON (NEAR NOTTINGHAM).—For laying sewers and surface-water drains, manholes, &c., and for forming, levelling, kerbing, channelling, paving, metalling, and making-up the following streets:—Foster Grove, Park Road, Mar Hill Road, Chandos Street, and Forester Street—for the Urban District Council:—

Cox & Son, Ilkeston	£2,008 10 4
Barry, Radcliffe-on-Trent	1,905 0 0
Bower Bros., West Bridgford	1,935 12 6
Cope & Raynor, Trent Boulevard, West Bridgford	1,885 18 6

* Accepted.

CLAY CROSS.—Accepted for the erection of 12 villas at Holingate, Claycross. Mr. Ernest Oxley, M.S.A., architect and surveyor, Clay Cross.

Joseph Hopkinson, Ashover, near Chesterfield.

CLAY CROSS.—Accepted for the erection of 12 dwelling-houses at Holingate, Clay Cross. Mr. Ernest Oxley, M.S.A., architect and surveyor, Clay Cross.

H. and H. Hopkinson, Ashover, near Chesterfield.

HASTINGS.—For the erection of a technical school on the Tower Road School site, for the Hastings (U.D.) School Board. Mr. A. W. Jeffery, architect, 5 Havelock Road, Hastings:—

J. Harvey, King's Road, St. Leonard's	£2,850
A. H. White, Southwater Road, St. Leonard's	2,825
Tapner, Simmonds, & Co., Waterworks Road, Hastings	2,820
J. Parker, 51 Ashburnham Road, Hastings	2,477
T. T. Denne, Upper Walmer, Kent	2,472
Padgham & Hutchinson, London Road, St. Leonard's	2,454
J. Lester, Eatin Street, Hastings	2,447
H. E. Crutenden, London Road, St. Leonard's	2,428
W. & E. Noakes, Calverley Road, Eastbourne	2,341
Gann & Co., Tankerton Works, Whitstable	2,295

* Accepted.

HORWICH.—For the erection of infectious diseases hospital, for the Norwich, Westhoughton, and Blackrock Committee, Lancashire:—

J. Edmundson & Co., Morecambe	£15,796 0 0
Parkinson & Siddle, Morecambe	15,544 0 0
J. H. Wright, Leigh	15,283 0 0
R. Mosley, Bolton	15,091 0 0
R. Baxendale & Sons, Chorley	14,881 0 0
S. J. Hodgkiss, Farnworth	14,865 10 8
Blackburn & Hastings, Blackpool	14,750 0 0
W. Cunliffe, Deane	14,420 0 0
L. Fairclough, Adlington	14,016 13 2
Atherton & Norris, Bolton	13,772 0 0
R. Carlyle, Manchester	13,409 0 0
W. J. Slater, Horwich	13,255 15 4

* Accepted.

KETTLESTONE RECTORY, NORFOLK.—Mr. Herbert J. Green, architect, 31, Castle Meadow, Norwich:—

Bardell Bros., King's Lynn	£627 0 0
J. Needs, Fakenham	563 8 4
W. J. Larnar, East Dereham	516 7 3

* Accepted.

LEYTON (ESSEX).—For making-up, paving, and kerbing certain private streets within their district, for the Leyton Urban District Council. Mr. William Dawson, M.I.C.E., surveyor:—

T. Adams, Wood Green	£13,844
C. Porter, Hackney	13,590
Meston & Hale, Kensington	12,774
W. Griffiths & Co., London	12,538
G. Wilson, Walthamstow	12,578
F. J. Coxhead, Leytonstone	12,255
W. Manders, Leyton	11,900
G. J. Anderson, Poplar	11,768
A. W. Porter, Leyton	11,710

[Surveyor's estimate, £12,800.]

* Accepted.

LONDON, E.—For pulling down and rebuilding the Bull's Head public-house, Ben Johnson's Road, Stepney, E., for Mr. Butterfield. Mr. J. C. Jackson, architect, Town Hall Chambers, Borough, S.E.:—

G. Parker	£1,447	Rice & Son	£1,320
King & Taylor	1,441	Edwards & Medway	1,253
W. Nash	1,398		* Accepted.

LONDON, N.—For alterations and additions at the Freemasons' Tavern, Wood Green, for Messrs. Watney, Coombe, Reid & Co., Limited. Mr. J. C. Jackson, architect, Town Hall Chambers, Borough, S.E.:—

Rice & Sons	£2,823	Courtney & Fairburn	£2,901
Webber & Co.	3,297	G. Volair	2,940
W. Nash	2,975	Edwards & Medway	2,911

* Accepted.

LONDON, S.W.—For the erection of a women's refuge at Tufton Street. Mr. H. Percy Adams, architect. Quantities by Mr. S. G. Thacker:—

Kerridge & Shaw	£4,680	W. King & Co.	£3,739
Higgs & Hill	4,124	Gough & Co.	3,534
Prestige & Co.	3,947		* Accepted.

LONDON, S.E.—For the erection of business premises, consisting of offices, workshops, and stable buildings, for Messrs. H. Smith & Son, at College Street, Lambeth. Mr. Cecil A. Sharp, architect, 11, Old Queen Street, Queen Anne's Gate, S.W. Quantities by Mr. T. J. Carless, 39 Old Queen Street, S.W.:—

Foster Bros.	£3,682	F. & H. F. Higgs	£2,968
J. B. Porter	3,210	Higgs & Hill, Ltd.	2,964
Patman & Fotheringham	3,135		* Accepted.

LONDON.—For the erection of school on the Macmardo Road site, Fulham Palace Road, for the London School Board. Mr. T. J. Bailey, architect:—

Martin, Wells & Co.	£29,085	Stimpson & Co.	£26,849
W. H. Lorden & Son	28,444	G. E. Wallis & Sons	26,628
Leslie & Co., Ltd.	28,304	McCormick & Sons	26,144
C. Cox	27,990	Holliday & Greenwood	26,115
J. Green	27,540	Ltd.	26,115
W. King and Son	27,450	J. & M. Patrick	25,337
Treasure & Son	27,029	Lathey Bros.	25,160
E. Lawrance & Sons	26,955	W. Johnson & Co., Ltd.	24,950

* Recommended for acceptance.

MARKET HARBOROUGH.—For the following paving and roadmaking works at the new cattle market, for the Market Harborough Urban District Council: (A) two acres tar macadam to roads; (B) one acre ordinary macadam to roads; (C) $\frac{1}{2}$ acre granite setts paving on concrete to beast pens; (D) half acre in situ concrete paving to sheep, calf, pig, and poultry pens. Mr. Herbert G. Coates, A.M.I.C.E., engineer, Market Harborough:—

A.—Tar macadam.	
J. Wainwright, Shepton Mallet	£2,877 18 0
Scudamore & Co., Northampton	2,473 13 3
North of England Asphalt Co., Manchester	1,831 4 2
W. Shepherd, Rochdale	1,709 1 6
G. H. Eastwood, Market Harborough	1,645 0 0
La Brea Asphalt Company, Birmingham	1,628 14 0
Bower Bros., Nottingham	1,468 13 9
T. Philbrick, Market Harborough	1,436 2 11
T. Philbrick, Leicester	1,382 5 0

B.—Ordinary macadam.	
North of England Asphalt Co.	677 12 5
W. Shepherd	484 5 9
Bower Bros.	473 8 0
A. Jewell	480 5 0
T. Philbrick	593 0 0

C.—Granite paving.	
G. H. Eastwood	4,707 10 0
W. Shepherd	3,852 13 1
Bower Bros.	3,685 5 4
North of England Asphalt Co.	3,676 2 5
T. Philbrick	2,940 6 7
A. Jewell	2,922 19 10

D.—Concrete paving.	
Ward & Co., London	823 11 0
W. Shepherd	797 7 8
Bower Bros.	785 1 0
A. Jewell	744 17 11
North of England Asphalt Co.	727 13 2
Empire Stone Co., Leicester	683 10 6
T. Philbrick	683 10 0
G. H. Eastwood	674 15 0
A. Walker & Sons, Leeds	569 0 0

* Accepted.

OLD TRAFFORD, MANCHESTER.—For the erection of public bath, Old Trafford, for the Stretford Urban District Council. Mr. Ernest Woodhouse, architect, 88, Mosley Street, Manchester:—

Geo. Lewis & Co.	£437 3 0
E. Bennis & Co., Ltd.	430 14 9
W. Brettell	417 7 0
Heenan & Froude	385 13 4
Walker Bros.	379 0 0
Carter Bros., Ltd.	373 19 8
Cross & Cross	372 9 2
Bruce & Still	362 10 11
Goddard, Massey & Warner	361 11 7
Edward Wood & Co., Ltd.	361 0 0
Dorman, Long & Co., Ltd.	353 0 0
E. C. & J. Keay, Ltd.	345 6 0
J. & T. Booth	342 1 6
Goddard, Massey & Warner	338 0 0
C. O. Dunkerley & Co., Ltd.	338 1 5
Pendleton Ironworks Co.	338 15 0
McIntyre & Jones	328 0 0
Manchester Iron and Steel Co.	308 15 0
Geo. Wilby & Co.	300 0 0
Schofield & Hancock	290 0 0
Geo. Taylor & Co.	280 0 0

* Accepted.

PETERBOROUGH.—For the addition of a Coronation wing at the infirmary, for the Infirmary Committee. Messrs. Townsend and Fordham, architects:—

Cracknell	£3,047	Furnis	£2,698
Hammond	2,970	Thompson	2,662

* The tender of Messrs. Thompson and Sons was accepted with the following additions: heating apparatus, £80; slabs on the frontage, £18—total, £2,760.

SOUTHBOROUGH.—For a relief outfall sewer at Southborough, for the Urban District Council:—

Relief outfall sewer.	
F. Osenton	8,805 0 0
J. Coker, Halling, Rochester	8,142 12 0
A. C. Soan, Streatham	3,829 11 1
B. Cooke & Co.	3,483 0 0
G. Bell, Tottenham, London	3,387 0 0
C. Castle & Co., Westgate-on-Sea	3,331 10 1
E. Iles, Junr., Wimbledon, Surrey	3,285 0 0
J. A. Dunmore, Crouch End, London	3,081 10 0
J. Jarvis, Tunbridge Wells	2,920 0 0
Peelless, Dennis & Co., Eastbourne	2,789 0 0
Sreeter & Todhunter	2,706 0 0
T. Hallett & Sons, Tunbridge Wells	2,264 2 10
Martin & Co.	2,211 0 0

* Accepted.

SOUTHBOROUGH (KENT).—For the construction of a pumping station at Upper Haydon, in the parishes of Bidborough, about 2½ miles south-west from Tonbridge Station, for the Southborough Urban District Council. Messrs. George and F. W. Hodson engineers, Loughborough:—

F. Osenton, Westerham	£14,683
Sreeter & Todhunter, Godalming	13,380
B. Cooke & Co., Westminster	12,835
Enness Bros., Erith	12,790
Martin & Co., Tonbridge	11,465
A. E. Nunn, Tenterden	11,359

* Accepted.

SYMOND GREEN (HERTS).—For the erection of a beer house and cottage, Symonds Green, Herts. Mr. J. Randall Vining, architect, 80, Chancery Lane, London, W.C.:—

A. Black & Son, London	£925
J. C. Bowyer, London	825
J. H. Aldridge, Waltham	730
S. Redhouse, Senr., Stotfold	700
W. Spratt, Stevenage	697
F. Newton, Hitchin	692
J. Willmott & Sons, Hitchin	680

* Accepted.

Unitarian Free Church Hall, London Road, Reading.—This hall, which was opened recently by the Mayor of Reading, consists of a spacious room with two classrooms, and lavatories and cloakrooms. The building is of red brick with tile roof. The floors are of wood-blocks. The architect is Mr. W. Jane, of Reading and Weston-super-Mare, and the contractor Mr. F. Newberry, of Reading.

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
BUILDING:			
Aug. 14	Willington—Church	School Board	John Kelly, 466 Oxford Street, London, W.
" 14	Barnes—Infants' School	London County Council	O. Jones, 50 Cannon Street, E.C.
" 14	Streatham—Fire-Brigade Station	Building Club	Architect's Department, 3 Warwick Street, Charing Cross, W.O.
" 14	Cefn Cribwr—Twenty Houses	Church Coppenhall School Board	J. & F. J. Hurley, 10 Bridgend Road, Ponda, Aberkenig.
" 14	Crewes—Enlargement of House	Sanitary Committee	J. A. Atkinson, Architect, Hightown, Crewe.
" 14	Fleur-de-Lis, Mon.—Ten Workmen's Houses	Technical Instruction Committee	G. Kenshole, Architect Station Road, Bargoed.
" 14	Manchester—Three Shelters at Hospital	Palmer's Shipbuilding and Iron Co., Ltd.	City Architect, Town Hall, Manchester.
" 14	Macclesfield—Improving School	Rev. Dr. Gaffney	J. Wright, Architect, Macclesfield.
" 14	Coventry—Repairs	Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 15	Leeds—Superstructure of Warehouse	Yorkshire Electric Tramways, Ltd.	W. E. Jones, Parkin & Bulmer, 7 Lockridge Street, Leeds.
" 15	Jarrow-on-Tyne—Dépôts	Right Hon. Viscount Falmouth	Rolling Mills and Blast Furnace Departments, Jarrow.
" 15	Mullingar—College	Mrs. Weir	J. J. O'Callaghan, 16 Nassau Street, Dublin.
" 15	Swadlincote Baptist Church—Enlargements	Urban District Council	C. Coulton, 88 Oxford Street, Church Gresley.
" 16	Abersychan—House	Corporation	T. B. Winstone, 16 High Street, Abersychan.
" 16	Chester—Additions, &c., to Farm Buildings	School Board	H. Beswick, County Architect, Newgate Street, Chester.
" 16	Dewsbury—Bricks, Cement, &c.	Corporation	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
" 17	Liversedge, Yorks—Car-Shed, Repairs Shop, Offices, &c.	Corporation	Architect, British Electric Traction Co, Ltd, 1 Adelphi Terrace, W.O.
" 18	Abergavenny—Stone Bridge and Wall	Rural District Council	John Gill, 4 Brecon Road, Abergavenny.
" 18	Cardiff—Basements, Foundations, &c., at Asylum	Corporation	Oatley & Skinner, Edinburgh Chambers, Baldwin Street, Bristol.
" 18	Aberaman—Hotel	Right Hon. Viscount Falmouth	L. Smith & Davies, Architects, Aberdare.
" 19	Bosfrankan—Stable, &c.	Corporation of London	Farmhouse, Bosfrankan, Cornwall.
" 19	Denton, near Gravesend—Water Tower at Hospital	Mrs. Weir	City Surveyor, Guildhall, E.O.
" 19	Wood Green—Twenty-two Dwelling Houses	Urban District Council	No. 9 Waldegrave Road, Turnpike Lane, Hornsey.
" 20	Rostrevor, Ireland—Villa	Corporation	W. J. Watson, Architect, Benvenue, Rostrevor.
" 22	Pontypridd, Mon.—Buildings, &c., at Electric Station	School Board	Reginald P. Wilson, 66 Victoria Street, Westminster, S.W.
" 25	Swindon—Extensions of Technical School	Corporation	Bishop & Pritchett, Architects, Regent Circus, Swindon.
" 26	Grimsby—Piling, Timbering and Concreting at School	Corporation	H. O. Scaping, Architect, Court Chambers, Grimsby.
" 27	Ipswich—Generating Station, Offices, &c.	Town Council	C. S. Peach, 28 Victoria Street, London, S.W.
" 27	Grays, Essex—Raising Ceilings, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.O.
" 27	Hampstead, N.W.—Bathroom at Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.O.
" 27	Tooting, S.W.—Fixing Iron Bands round Chimney	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.O.
" 27	Newport, Mon.—Lunatic Asylum	Corporation	Borough Engineer, Town Hall, Newport, Mon.
" 28	Gloucester—Nurses' Home	Committee	Vale & Kingsford, George Street, Gloucester.
" 28	Bristol—Foundations, Subways, &c.	Corporation	H. Faraday Proctor, City Electrical Engineer, Temple Back, Bristol.
" 28	Haslemere, Surrey—Church	Devon County Council	Spooner & Cobbald, 17 Red Lion Square, Holborn, E.O.
" 29	Crownhill, near Plymouth—Police Station	Consent Iron Co., Ltd.	E. H. Harbott, a County Surveyor, Queen Street, Exeter.
" 30	Newcastle-on-Tyne—Offices, &c.	Corporation	C. E. Oliver, Company's Architect, Consent.
Sept. 2	Swindon—Covering in Market Site	School Board	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
" 8	Walsall—School	School Board	H. E. Lavender, Architect, Bridge Street, Walsall.
" 9	Enfield—Deaf Centre and Additions to School	School Board	G. K. T. Laurence, 22 Buckingham Street, Adelphi, W.O.
" 10	Bristol—Infirmary	Guardians	J. Simpson, Clerk, St. Peter's Hospital, Bristol.
" 11	Hackney—Coal Stores	Borough Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
ENGINEERING:			
Aug. 14	Andover—Steel and Concrete Bridge	Rural District Council	J. Wormald, South Cottage, Andover.
" 14	Kilkenny—Well	Rural District Council	Kieran Comerford, Clerk to Council, Kilkenny.
" 14	Roserea, Ireland—Fire Hose	No. 1 Rural District Council	T. Dooley, Clerk, Council Office, Roserea.
" 15	London—Bridges	County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 15	London, S.W.—Economisers	County Council	County Hall, Spring Gardens, S.W.
" 15	Anstruther, Scotland—Drainage Scheme	Town Council	Jamieson & Guthrie, Town Clerks, Anstruther.
" 16	Karls Barton—Reservoirs, &c.	Higham Ferrers & Rushden Water Board	R. E. Middleton, 17 Victoria Street, S.W.
" 16	Fernoy—Sinking Well	Rural District Council	F. O'Neill, Clerk, Workhouse, Fernoy.
" 16	Rushden, Northants—Storage Reservoir, &c.	Higham Ferrers & Rushden Water Board	R. E. Middleton, 17 Victoria Street, S.W.
" 16	Whitwick—Railway	Whitwick Granite Co., Ltd.	Company's Office, Whitwick, near Leicester.
" 18	Belfast—Dredger	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Harbour Offices, Belfast.
" 19	Ilford—Tramway Watering Car	Urban District Council	W. O. C. Hawtayne, 9 Queen Street Place, London, E.O.
" 19	Denton, near Gravesend—Pump and Fire Appliances	Corporation of London	City Surveyor, Guildhall, E.O.
" 20	Rugby—Electrical Plant	Urban District Council	W. H. Trentham, 39 Victoria Street, Westminster, S.W.
" 20	Glasgow—Boilers, Laundry Machinery, Heating Apparatus, &c.	Parish Council	Clerk of Works, 9 Dauchattan Street, Glasgow.
" 20	Ilfracombe—Masonry Intakes, &c.	Urban District Council	O. M. Prouse, Town Hall, Ilfracombe.
" 21	Selangor, Malay States—Electrical Plant and Materials	Crown Agents for Colonies	Crown Agents for the Colonies, Downing Street, S.W.
" 21	Ilkeston and Heanor—Waterworks	Urban District Council	G. & F. W. Hodgson, Engineers, Loughborough.
" 21	Bristol—Culverts, Subways, &c.	Electrical Committee	H. F. Proctor, City Electrical Engineer, Temple Back, Bristol.
" 22	Pouthowram—Main Sewer, Sewage-disposal Works, &c.	Council	F. Massie, Engineer, Tetley House, Wakefield.
" 23	Plymouth—Overhead Line Construction	Corporation	E. G. Okell, Borough Electrical Engineer, Priace Rock, Plymouth.
" 23	Colchester—Alterations to Pumps	Town Council	C. E. Blind, Town Hall, Colchester.
" 23	Malvern—Electricity Supply Works	Urban District Council	H. P. Maybury, Engineer, Council House, Malvern.
" 24	London—Dredging Thames	Conservancy	Thames Conservancy Offices, Victoria Embankment, E.O.
" 27	Honiton—Reservoirs	Town Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster, S.W.
" 29	Southampton—Fire Escapes, &c.	Corporation	Superintendent Johnson, Municipal Offices, Southampton.
Sept. 1	Valparaiso, Chile—Electric Tramways	Tramway Committee	Chilian Consulate, 10 Lane Street, E.O.
" 3	Leicester—Electrical Tramway Works	Harbour Trustees	E. G. Mawbey, Town Hall, Leicester.
" 4	Swansea—Hydraulic Accumulators, &c.	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
" 4	Swansea—Drawbridge	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
" 14	St. Petersburg, Russia—Two Bridges over River Neva	Mayor and Aldermen	The Delegation municipale, St. Petersburg.
" 15	Lanuceston, Tasmania—Electric Power Transmission Extensions	Ministry of Public Works	J. Terry & Co., 7 Great Winchester Street, E.O.
" 15	Cairo—Widening Canal	Directors, N.E.R.	Inspector of Irrigation, Projects Circle, Minia.
" 30	Port Adelaide, South Australia—Harbour	Directors, N.E.R.	Agent-General for South Australia, 1 Grosvenor Square, London.
Oct. 7	Newcastle-on-Tyne—Electrification of Line	Directors, N.E.R.	Wilson Wordsell, N.E.R., Gateshead-on-Tyne.
IRON AND STEEL.			
Aug. 16	Newton-in-Makerfield—Pipes and Valves	Urban District Council	C. Cole, Clerk, Town Hall, Earlestown, Lancs.
" 16	Dewsbury—Manhole Covers, Gulleys, Castings, &c.	Corporation	H. Dearden Borough Engineer, Town Hall, Dewsbury.
" 19	Christiana—Rails, &c.	Norwegian State Railways	Line Manager, Christiansia.
" 20	Portsmouth—Ironmongery, Pipes, &c.	Corporation	Clerk, Town Hall, Portsmouth.
" 23	Prenzlau—Rails, &c.	Union Guardians	Mr. Langenbein, Kreisbauinspector, Prenzlau, Germany.
" 27	Stoke-on-Trent—Iron Balconies, &c.	Great Indian Peninsula Railway Co	O. Lynaen, Architect, Stoke-upon-Trent.
" 30	Pietermaritzburg—Rails, &c.	Great Indian Peninsula Railway Co	Ford Brothers, 12 Southampton Street, Fitzroy Sq., London, W.
" 30	Karlsruhe—Six Locomotive Boilers	Great Indian Peninsula Railway Co	State Railway, Karlsruhe, Germany.
" 31	London, E.O.—Wheels, Axles, &c.	Great Indian Peninsula Railway Co	Secretary's Office, 48 Coppenal Avenue, London, E.O.
Sept. 1	London, S.W.—Rails and Fishplates	Harbour Board	Agent-General for Victoria, 15 Victoria Street, S.W.
" 1	Southampton—Stud Chain, Anchors, Buoys &c.	Harbour Board	W. Bowyer, Superintendent, Harbour Office, Southampton.
FURNITURE:			
Aug. 14	London, S.W.—Roller Blinds	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.O.
" 22	Richmond, Surrey—Workhouse Furniture, Fixtures and Fittings, &c.	Union Guardians	E. J. Partridge, Bank Chambers, Richmond.
" 30	East Ham—Furnishing Council Chamber	Urban District Council	H. A. Cheers, 35 Waldegrave Park, Twickenham.
Sept. 2	Plymouth—700 Desks, &c.	School Board	E. O. Cook, 18 Princess Square, Plymouth.
PAINTING AND PLUMBING.			
Aug. 14	Coventry—Painting and Plumbing at School of Art	Technical Instruction Committee	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 14	Frestwich—Painting, &c., at Workhouse	Union Guardians	H. R. Chambers, Workhouse Master, Crumpsall, Frestwich.
" 15	London, S.W.—Repainting, &c., Chelsea Bridge	County Council	Engineer's Department, County Hall, Spring Gardens, S.W.

COMPLETE LIST OF CONTRACTS OPEN—continued

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
PAINTING AND PLUMBING—continued.			
Aug. 16	Dewsbury—Paints, Oils, &c.	Corporation	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
" 20	Plymouth—Oils, Paints, Brushes, Plumbing, &c.	Corporation	Clerk, Town Hall, Plymouth.
" 21	Dewsbury—Whitewashing, &c.	Guardians	Master, Workhouse, Dewsbury.
" 27	Grays, Essex—Cleaning and Painting Works	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
ROADS AND CARTAGE:			
Aug. 14	Halwell, near Totnes—Carriage Drive, &c.	County Council	W. Peeke, High Washbourne.
" 15	London, S.W.—Repairing	Corporation	Engineer's Department, County Hall, Spring Gardens, S.W.
" 16	Dewsbury—Setts, Broken Granite, Kerbs, Flags, &c.	School Board	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
" 19	Ashford—Tar Paving Playground	Urban District Council	Jeffery & Lacy, Architects, North Street, Ashford.
" 19	Bishop's Stortford—Granite, Gravel, &c.	Rural District Council	Thomas Swatheridge, Council Offices, Bishop's Stortford.
" 19	South Mimms—Granite, &c.	Corporation	G. Dickinson, Byfield, 16 High Street, Barnet, Middlesex.
" 20	Portsmouth—Paving, Gravel, &c.	Urban District Council	Surveyor, Town Hall, Portsmouth.
" 22	Woodford—Kerbing, Channelling, &c.	Corporation	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
" 26	Woodford—Road Rollers	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
" 26	Clutton—Steam Rolling	Rural District Council	J. S. Drury, Clerk, Council Offices, Temple Cloud, near Bristol.
" 27	Bedford—Broken Granite	Corporation	R. O. Seacombe, Town Clerk, Town Hall, Bedford.
" 27	London, S.W.—Tar Paving	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 28	Barnet—Granite	Urban District Council	H. York, Surveyor, Council Offices, Barnet.
" 30	Bourne—Carting	Rural District Council	A. J. Metcalfe, Surveyor, Bourne.
SANITARY:			
Aug. 14	Much Wenlock—Laying Pipes, &c.	Sanitary Committee	G. C. Cooper, Town Clerk, Much Wenlock, Shropshire.
" 15	Tadcaster—Scavenging	Rural District Council	H. Denham, Inspector of Nuisances, Aberford, near Leeds.
" 16	Dewsbury—Pipes, Lime, &c.	Corporation	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
" 16	Bierton—Sewer	Rural District Council	W. E. Stanley, Birtton Road, Aylesbury.
" 16	Cudworth—Scavenging	Urban District Council	W. E. Raley, Clerk to the Council, Barnsley.
" 18	Heywood—Sewers	Town Council	J. Diggle, Hind Hill Street, Heywood.
" 18	Sevenoaks—Sewer	Urban District Council	S. Towilson, Council's Offices, Sevenoaks.
" 18	Bangor—Collection of House Refuse	Sanitary Committee	J. Gill, Borough Surveyor, Bangor.
" 19	Kingsworth, near Ashford, Kent—Reconstructing School Drainage System	County Council	F. W. Ruck, 86 Week Street, Maidstone.
" 20	Portsmouth—Lime, Disinfectants, Drain Pipes, &c.	Corporation	Clerk, Town Hall, Portsmouth.
" 28	Hendon—Pipe Sewers	J. E. B. Cox	Pollard & Tingle, 31 Old Queen Street, Westminster.
TIMBER:			
Aug. 16	Dewsbury—Timber, Oreosote, &c.	Corporation	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
" 20	Portsmouth—Timber, &c.	Corporation	Clerk, Town Hall, Portsmouth.
" 30	Pietermaritzburg—Sleepers	Corporation	Ford Brothers, 12 Southampton Street, Fitzroy Square, London, W.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug. 23	Clacton-on-Sea—School Board	—	O. E. White, Clerk to School Board, Wellesley Road, Clacton-on-Sea.
" 30	Sunderland—Police and Fire-Brigade Buildings	£100, £50, £25.	Borough Engineer, Town Hall, Sunderland.
" 30	Deptford, S.E.—Town Hall and Municipal Offices	£100, £75, £50.	V. Orchard, Town Clerk, 20 Tanner's Hill, Deptford, S.E.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprava, St. Petersburg.
" 7	Southend—Church, Clergy House, Hall, &c.	—	O. H. J. Talmage, Southchurch Road, Warnor Square, Southend-on-Sea.
" 15	Liverpool—Labourers' Dwellings	£250, £150, £100.	Town Clerk, Liverpool.
" 16	London, S.E.—Artizans' Dwellings	£100, £60, £40.	F. Ryall, Town Clerk, Bermondsey Town Hall, Spa Road, S.E.
" 23	London, N.—Municipal Buildings, Fire Station, Baths, &c.	£200, £100, £50.	W. H. Prescott, Engineer, U.D.O. Offices, Tottenham.
" 29	Bideford—Municipal Offices and Public Library	£30, £15, £10.	W. B. Seldon, Town Clerk, 18 The Quay, Bideford.
Oct. 1	Maidenhead—Free Library	£50, £20, £10.	John Kick, Town Clerk, Guildhall, Maidenhead.
Nov. 1	Allahabad—Memorial to Queen Victoria	2,000 Rs.	H. N. Wright, Indian Civil Service, Allahabad, India.
Jan. 31	Cape Town—University Buildings	£400, £200, £100.	Agent-General for the Cape of Good Hope, London.
No date.	Peterborough—Development of Land	£25.	F. S. Collins, Solicitor, Ross, Herefordshire.
"	Montreal, Canada—Monument in Honour of Canadian Soldiers who fought in S. Africa	—	P. Davidson, London and Lancs Buildings, Montreal, or Bank of Montreal 22 Abchurch Lane, E.C.
"	Bristol—Reference Library	—	E. J. Taylor, The Council House, Bristol.
"	Grantham—Cottage Home	£5 5s.	Town Clerk, Grantham.
"	Barry—Municipal Buildings	£150, £100, £50.	J. O. Pardoe, District Council Office, Barry.
"	Denby Dale, Huddersfield—Hall and Schools	[Rest. to Local Architects.]	G. W. Moxon, Denby Dale.
"	Glasgow—Sketch Plan of Libraries	—	J. D. Marwick, Town Clerk, City Chambers, Glasgow.

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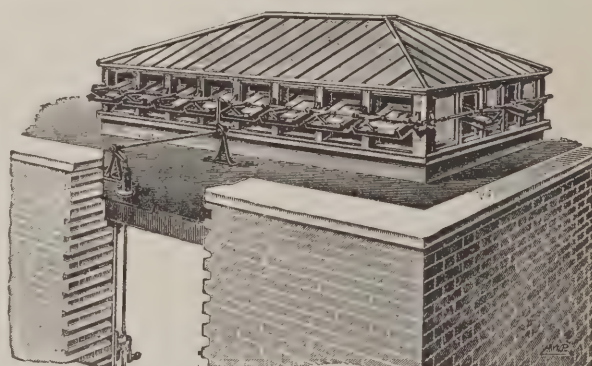
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FORAGE.			
	£ s. d.	£ s. d.	
Beans .. per qr.	1 15 0	2 0 0	
Clover, best .. per load	4 15 0	5 10 0	
Hay, best .. do.	6 5 0	5 12 6	
Sainfoin mixture .. do.	4 10 0	5 5 0	
Straw .. do.	1 16 0	2 8 0	

OILS AND PAINTS.			
Castor Oil, French .. per cwt.	1 5 9	—	
Colza Oil, English .. do.	1 6 6	—	
Copperas .. per ton	2 0 0	—	
Lard Oil .. per cwt.	2 13 0	2 14 0	
Lead, white, ground, carbonate do.	1 4 10	—	
Do. red .. do.	1 0 4½	—	
Linseed Oil, barrels .. do.	1 9 6	—	
Petroleum, American .. per gal.	0 0 5½	0 0 5½	
Do. Russian .. do.	0 0 5½	0 0 5½	
Pitch .. per barrel	0 7 0	—	
Shellac, orange .. per cwt.	5 6 0	5 0 0	
Soda, crystals .. per ton	3 9 6	3 5 0	
Tallow, Home Melt .. per cwt.	1 10 0	1 11 6	
Tar, Stockholm .. per barrel	1 2 6	—	
Turpentine .. per cwt.	1 13 1½	—	

METALS.			
Copper, sheet, strong .. per ton	69 0 0	—	
Iron, Staffs, bar .. do.	6 10 0	8 10 0	
Do. Galvanised Corru ..	—	—	
gated sheet .. do.	11 7 6	11 12 6	
Lead, pig, Soft Foreign .. do.	11 2 6	11 3 9	
Do. do. English common .. do.	11 5 0	11 7 6	
Do. sheet, English 3lb ..	—	—	
per sq. ft. and upwards .. do.	13 5 0	—	
Do. pipe .. do.	13 15 0	—	
Nails, cut clasp, 3in. to 6in. .. do.	9 5 0	—	
Do. floor brads .. do.	9 0 0	—	
Steel, Staffs, Girders and ..	—	—	
Angles .. do.	5 15 0	6 5 0	
Do. do. Mild bars .. do.	6 10 0	7 0 0	
Tin, Foreign .. do.	126 17 6	127 7 6	
Do. English ingots .. do.	127 0 0	127 10 0	
Zinc, sheets, Silician .. do.	22 7 6	—	
Do. do. Vieille Montaigne .. do.	24 10 0	—	
Do. Spelter .. do.	18 13 9	18 13 9	

TIMBER.

SOFT WOODS.

	£ s. d.	£ s. d.
Fir, Dantzic and Memel .. per load	3 0 0	4 10 0
Pine, Quebec, Yellow .. per load	4 7 6	6 0 0
Do. Pitch .. do.	2 14 0	3 1 0
Laths, log, Dantzic .. per fath.	4 10 0	5 10 0
Do. Petersburg .. per bundle	0 8	—
Deals, Archangel 2nd & 1st per P. Std.	16 15 0	24 15 0
Do. do. 4th & 3rd .. do.	8 10 0	15 15 0
Do. do. unsorted .. do.	5 12 6	6 10 0
Do. Riga .. do.	6 15 0	12 10 0
Deal, Petersburg 1st Yellow .. do.	16 5 0	—
Do. do. 2nd .. do.	9 0 0	12 10 0
Do. do. White .. do.	7 5 0	12 10 0
Deal, Swedish .. do.	8 15 0	16 15 0
Do. White Sea .. do.	13 5 0	17 5 0
Do. Quebec Pine, 1st .. do.	18 10 0	22 5 0
Do. do. 2nd .. do.	22 5 0	—
Do. do. 3rd & 4th .. do.	9 5 0	—
Do. Canadian Spruce, 1st .. do.	7 10 0	12 10 0
Do. do. 3rd & 2nd .. do.	9 0 0	9 10 0
Do. New Brunswick .. do.	7 5 0	8 0 0
Battens, all kinds .. do.	7 12 6	10 5 0
Flooring Boards lin. ..	—	—
prepared, 1st .. per square	0 9 3	0 13 9
Do. 2nd .. do.	0 10 6	0 16 2
Do. 3rd & 4th .. do.	0 8 6	0 9 3

HARD WOODS.

Ash, Quebec .. per load	3 17 6	4 10 0
Birch, Quebec .. do.	3 12 6	3 17 6
Box, Turkey .. per ton	7 0 0	15 0 0
Cedar, lin., Cuba .. per ft. sup.	0 0 4½	—
Do. Honduras .. do.	0 0 1½	—
Do. Tobasco .. do.	0 0 5½	—
Elm, Quebec .. per load	0 12 6	5 10 0
Mahogany, Average Price .. per ft. sup.	0 0 3½	0 0 3½
for Cargo, Honduras .. do.	0 0 4	—
Do. African .. do.	0 0 4	—
Do. St. Domingo .. do.	0 0 5½	—
Do. Tobasco .. do.	0 0 3½	—
Do. Cuba .. do.	0 0 5½	—
Oak, Dantzic and Memel .. per load	3 15 0	5 7 6
Do. Quebec .. do.	4 12 6	7 15 0
Teak, Rangoon, planks .. do.	16 0 0	17 10 0

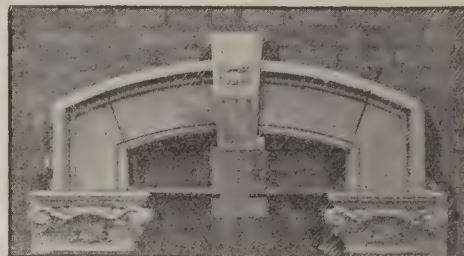
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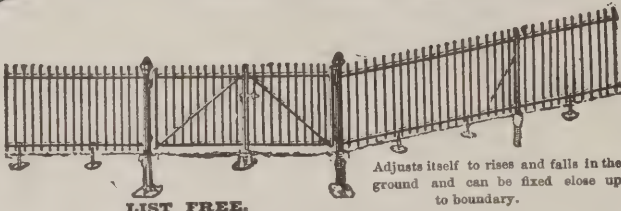
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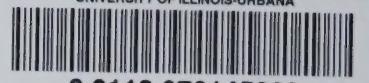
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